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Economic Development of Underdeveloped Areas: Past and Present

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MANY countries of the Western World, and some in the East as well, are engaged in programs of technical and capital assistance to underdeveloped areas, designed to raise per capita incomes and levels of social welfare. When these programs began, there was a widespread impression that much could be done by sending out experts, who would quickly discover the reasons for low productivity or low social standards in underdeveloped areas, indicate the way in which the difficulties could be overcome—and return home. Gradually, however, it has been recognized that the problem of developing the less developed countries is too deep-seated and too wide in scope to be solved in this manner. Expert after expert, in all manner of fields, comes back from a technical assistance mission feeling frustrated and inadequate, convinced that only fundamental changes in economic and social organization, and in social and political attitudes, will transform the stagnant and impoverished countries of the world into prosperous and progressing ones. Many

of these experts are appalled by the complexity of the problem, and by the enormous range of knowledge needed to grapple with it.

One analytical approach to the problem of economic development is to ask, "How did it happen before?" "What were the strategic factors in the economic and social situation of Europe between 1700 and 1850, or in the New World between 1800 and 1950, which resulted in the rapid economic growth in those areas and in those periods?" Even a superficial examination of the economic history of the Western World between 1700 and 1950 reveals an extraordinary conjuncture of favorable factors—economic, political, sociological, and technical. Was this conjuncture an historical accident, which cannot be recreated by economic or social policy? In what follows, the strategic factors which gave rise to the growth of the now advanced countries are compared with the situation in underdeveloped countries today, in hopes that such a comparison will illuminate the true nature of the problem of economic development of underdeveloped areas. Since it strays over several countries, fields and centuries, the treatment is

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necessarily superficial. At the present stage of scientific development in this field, however, even research programs can be useful, and social scientists who have had field experience in development of underdeveloped areas have an obligation to share their preliminary conclusions. It is in this spirit that the article is submitted for criticism.

I. Economic Factors

All general theories of economic development, from Adam Smith to Rostow, Kalecki, or Keirstead, relate increases in per capita income to four major factors: capital accumulation, population growth, discoveries of new resources, and technological progress. These four factors are interrelated in various ways; indeed, theories of economic development differ mainly with regard to the presumed nature of these interrelationships. Those theories that go behind these factors to broad sociological forces influencing them (such as the theories of Weber, Sombart, and Schumpeter) differ also with respect to the relative importance of these underlying causal forces. For the purposes of this article, however, refinements of theory can be ignored. We shall content ourselves with comparing conditions affecting these four factors in the now advanced countries, during the period of their most rapid growth, with conditions affecting them in the now underdeveloped countries.

Capital Accumulation. The effect of capital accumulation on development is ambivalent. Each act of net investment raises national income, but retards further net investment. Other things being equal, profits tend to decline as the stock of capital grows. For continued economic expansion to take place, one or more of the other three factors must operate favourably, so as to produce a steady rate of capital accumulation.[1]

In the now advanced countries, net savings and investment during the periods of rapid growth averaged between ten and twenty percent of national income. In the now underdeveloped countries, net savings and investment seem to run from two to six percent of the national income. Here is one of the many vicious circles encountered in any study of the problem of economic development. A high level of national income results in a high level of savings and investment, and consequently in a rapid rate of economic growth. Underdeveloped countries in general have incomes so low as to make any substantial volume of savings and investment out of existing income extremely difficult. The problem of economic growth is to a large extent a problem of "getting over the hump," to the point where levels of per capita income are high enough to permit sufficient net savings and investment to guarantee continued expansion.

There have recently been suggestions that significant increases in *per capita* income can be achieved without much capital investment.[2] My own views on this matter have been expressed previously;[3] in brief, they are that opportuni-

[1] Dr. Hans Singer comments that "other things" are so unlikely to "be equal" when net investment takes place that this statement may be misleading. I do not really disagree with Dr. Singer on this point. For one thing, capital accumulation and technological progress usually go together. Economies of scale and discontinuities may appear. Underdeveloped countries may be in the phase of increasing returns to capital. But I do not wish to analyze here all the considerations involved in "steady growth" lest I find myself enmeshed in the theories of Domar, Hicks, Harrod, Kalecki and others. I hope soon to tackle the "steady growth" problem as such, and will abide by the above statement as a purely analytical proposition for the purposes of this article.

[2] Cf. James Duesenberry, "Some Aspects of the Theory of Economic Development," *Explorations in Entrepreneurial History*, December 1950; Ragnar Nurske, *Problems of Capital Formation in Underdeveloped Countries* (New York: Oxford University Press, 1953); and International Labour Office, *Report of the Director-General* (Geneva, 1953) pp. 37-48.

[3] Benjamin Higgins, "Duesenberry on Economic Development," *Explorations in Entrepreneurial History*, April 1951.

ies for raising per capita output in a fashion requiring little *per capita* investment should certainly be seized; but that opportunities for this type of development project are not sufficient in themselves to get the underdeveloped countries "over the hump"—unless a new technology, suited to the factor endowment of these underdeveloped countries, can be discovered.   This new technology, which would be labor-absorbing and capital-saving, would have to apply over a much wider range of economic activity than the roadbuilding, irrigation, and similar projects proposed for the purpose of absorbing disguised unemployment and raising productivity without much investment. Here, where we are concerned with a comparison of what did happen in the now advanced countries with what might happen in the now underdeveloped ones, we need make only two observations: first, the "trigger mechanism" of the Industrial Revolution did not consist of such projects as building roads and undertaking irrigation projects with disguised unemployed labor utilizing known techniques, but rather of technical advance occurring more or less simultaneously over a wide field; second, that at least some of the underdeveloped countries have transport facilities and irrigation systems in a relatively advanced state.   There seems no way out of an increased flow of savings and investment if the less developed countries wish to enjoy high standards of living.

Population Growth.   It is useful to distinguish four types of population situations. First, population may be less than optimum, in the strict technical sense that *per capita* income could be raised merely by increasing the size of the population, with no changes in other strategic variables.   Second, *per capita* income may not rise with increasing population alone, but a feasible development program might create a situation in which population growth would have a favorable effect on *per capita* income. Third, the   marginal productivity of labor (and thus of population increases) may be positive, although *per capita* income would fall with rising population, despite any measures that could be taken as part of any feasible development program.   Fourth, the situation may be one in which the marginal productivity of labor is zero or negative, and will remain so despite the development program.

Some of the now advanced countries, such as Canada, are still in the first category.   More important, virtually all of the advanced countries were in this category *at the beginning* of their periods of most rapid growth.   The Industrial Revolution began at a time when European populations were very low.   With technological progress, resource discoveries, and expanding world markets, the level of the optimum population became steadily higher, so that actual population remained below optimum throughout most of the period of rapid growth.

Some of the Latin American countries appear to be in category two; a rise in population by itself might not raise per capita income, but appropriate and feasible development plans could create a situation in which population growth would have a favorable effect on per capita income.   Most of the Middle Eastern and Southeast Asian countries (with the possible exceptions of Burma, Thailand and Indochina) are, unfortunately, in the third or even in the fourth category.

There is therefore a discontinuity in the growth function with respect to population increases.   Where population grows in a country blessed with less than optimal population, in which effective demand is a more important limitation on investment than is the flow of savings,

and an addition to the labor supply can in itself raise per capita output and income if effective demand rises as well, population growth provides an additional stimulus to expansion, by encouraging investment in housing, transport, public utilities, and the like, and by permitting optimal capital/labor ratios to be maintained as capital accumulates. But where populations are already above optimum levels, where lack of savings rather than lack of effective demand limits investment, and where an addition to the labor supply would lower per capita output and income even if employment is found for it, further increases in population act only as a drag on economic development, preventing any increase in per capita income from taking place, or even lowering per capita income, and thus aggravating the difficulty of saving and investing enough to generate expansion.

Moreover, the population growth of underdeveloped countries takes a very wasteful form. The combination of high birth rates and high death rates means that a large proportion of the population consists of unproductive children, many of whom will not live long enough to repay the community's investment in them.[4] Death rates tend to fall with economic and social development, improving the age distribution but adding to total population pressure.

No expert can suggest any simple short-run policy to meet this situation. The happy circumstance in which economic expansion took place at a time when populations were below optimum, so that population growth was a favorable factor in the development picture, cannot be reproduced in most of the now underdeveloped countries, except by drastic measures introduced in the social,

economic and technical fields all at once.

Discovery of New Natural Resources. The discovery of new natural resources, or the opening up of frontiers, plays a prominent role in most recent theories of economic development. It is worth noting at the outset, however, that in all these theories it is implied, if not explicitly stated, that resource discovery is not enough in itself to produce economic growth; an *increasing rate* of resource discovery is required.[5] Insofar as resource discovery is a factor influencing past and present levels of investment, a constant rate of discovery is needed merely to prevent a *decline* in investment, and thus in employment and output. This consideration is an important one since most underdeveloped countries have enjoyed substantial rates of resource discovery in the past. In the former colonial areas especially, considerable time, effort, ingenuity and capital have been devoted to discovery and development of new natural resources. In these areas, producing a rate of resource discovery *more rapid* than that which has taken place in the past will be no easy task.[6]

The problem is complicated by the fact that most underdeveloped areas do not have "frontiers" in the sense that they existed in the New World in the nineteenth century, or even in the sense that they existed in Europe in the eighteenth century. The peoples of the present underdeveloped areas do not have the

[4] Cf. Hans Singer, "Population and Economic Development," paper presented to the World Population Conference, Rome, September 1954.

[5] See for example: Benjamin Higgins, "The Theory of Increasing Underemployment," *The Economic Journal,* June 1950; Evsey Domar, "Capital Expansion, Rate of Growth and Employment," *Econometrica,* April 1946, "Expansion and Employment," *The American Economic Review,* March 1947, and "Investment, Losses and Monopoly," *Income, Employment and Public Policy* (Essays in Honour of Alvin Hansen) (New York: W. W. Norton & Co., Inc., 1948); R. F. Harrod, *Towards A Dynamic Economics* (London: The Macmillan Co., 1948); and Burton Keirstead, *The Theory of Economic Change* (Toronto: The Macmillan Co., 1948).

[6] Dr. Charles Wolf points out that resource discovery may have higher "super-multiplier" effects now than in the past since the share of foreign capital in resource development and the consequent "leakage" of profits transfers may be smaller.

opportunity of moving to virgin land that is richer than the land now occupied. My personal experience is based mainly on Indonesia and Libya; my conclusion with respect to those two countries is that the distribution of population reflects very accurately the distribution of known resources, including soil fertility. In Libya, moving from the settled areas means moving out into the Sahara. In Indonesia, the areas being considered for transmigration in order to relieve population pressure in Java and provide opportunities for technically improved agriculture, are far indeed from being easily accessible, virgin and rich. They fall mainly into one of two categories. Some are cut-over areas, once intensively cultivated and later abandoned, and now covered with tough and useless alang-alang grass which is difficult and expensive to remove. The rest is jungle, virgin perhaps, but extremely difficult and expensive to clear. Moreover, the soil in these areas is less fertile than the rich volcanic soils of Java, from which the settlers are to come. In neither of these countries, therefore,—and I suspect in few other underdeveloped countries— do people have the opportunity of moving from where they now are to areas *still richer* in agricultural resources than those they formerly occupied.

The outlook with respect to mineral resources is less clear, since surveys are not complete. On the other hand, a good deal of energy and money has been spent by colonial powers in searching for mineral resources. In Libya, these searches have been largely futile. In Indonesia, they have been more rewarding; but at the moment, instead of finding it easy to move to new territories and find new mineral resources, some enterprises now operating in the country are worried about exhaustion of present known reserves. New exploration and research, new discoveries, and new development are necessary *merely to maintain current rates of production.* To discover enough new natural resources to generate still higher levels of developmental investment than occurred in the past will be a difficult task.

Apart from the influence on investment through the production function, and through presentation of new market opportunities, the frontier as it existed in Canada or the United States was an important growth factor through the inculcation of a "frontier spirit." The possibility of "moving West," to areas where the land was fertile and mineral resources were abundant, kept alive a venturesome entrepreneurial spirit throughout a century and a half. If one plots a curve of the centroid of population in the United States between 1790 and 1950, and extrapolates to 1990, with the date on the horizontal axis and west longitude on the vertical axis, one obtains an almost perfect growth curve. The inflection point occurs at about 81 degrees west in 1950; "average westward movement" reaches its maximum at about 85 degrees west in 1880; stability is reached at about 88 degrees west towards the end of this century. It is obvious that the secular growth of the American economy as a whole would correlate closely with this curve, especially up to World War I.[7] The strength of the "frontier spirit," generated by this westward movement, was undoubtedly a factor in this growth.

Dr. Carter Goodrich was among the first to recognize that the relative lack of venturesome entrepreneurship in Australia, and the accompanying relative stagnation after 1924 can be traced in part to the absence of a "poor man's frontier" of the kind that prevailed in

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[7] The fluctuations generated by the two World Wars and the Great Depression complicate any effort to discern secular growth since 1914.

Canada or the United States, and an accompanying absence of westward movement.[8] The grabbing of huge tracts of land by "rich squatters" created employment opportunities in the suburbs of Melbourne and Sydney but not in the interior of the country. Development of the interior resulted in population growth on the fringe, not in the interior.[9] Clearly, it requires a different sort of attitude to set up a grocery shop in a suburb of Sydney than to move hundreds of miles to the westward and launch a new enterprise in strange, raw territory.

But if a frontier in the Canadian or American sense was lacking in Australia, its absence is still more striking in the case of most underdeveloped areas. For centuries, such economic development as took place brought no obvious movement in the centroid of population. Nothing remotely resembling the westward movements in the United States and Canada, or even the movements from country areas to cities in nineteenth-century England, has taken place in most underdeveloped areas. Consequently, no "frontier spirit" is to be found in these countries.[10] Is it not possible that venturesome entrepreneurship, inculcated by generations of steady movement to new territories, may extend also to the frontiers of knowledge? May there not be a relationship between the lack of interest in movement to new territories, and the lack of interest in the introduction of new techniques?

[8] Carter Goodrich, "The Australian and American Labor Movements," *The Economic Record*, November 1928. For a generation after 1924 man-year productivity in Australia stagnated relative both to previous trends in Australia and to development in other "young" countries.

[9] Of course, it is also true that westward movement in Australia was inhibited by the "dead center" of the country; but my point here is that population was not drawn to those parts of the country which *were* developed agriculturally.

[10] Some of the larger Latin American countries may be exceptions to this rule.

Technological Progress. Most theories of economic development lay primary stress on technological progress. Here too it is worth noting that, in most of these theories, it is an *increase in the rate* of technological progress, rather than the mere existence of technological progress, which produces economic expansion.[11] Few underdeveloped countries indeed have been without substantial improvements in technique in the past. The problem is not merely one of introducing some degree of improvement in techniques, it is a matter of raising the *rate* of technological progress.

The outlook in this connection is certainly more favorable than in the case of resource discoveries or population growth. It cannot be denied that the level of techniques is low in the sector of underdeveloped areas in which the larger proportion of the population is occupied. During the "catching up period," while the level of techniques in these sectors is approaching that of the advanced countries—or of the advanced sector in the same countries—the rate of technological

[11] This statement is made with a certain type of "growth" model in mind in which steady growth requires a constant precentage increase in investment. The point is dealt with explicitly in my "The Theory of Increasing Underemployment," *loc. cit.*, and is inherent in the Harrod, Domar, Kalecki models. I believe that it is also implicit in the Keirstead model, although his presentation is less rigorous. However, it must be confessed that those models were all constructed to analyze advanced economies rather than underdeveloped ones. There seems no reason, at first blush, why per capita income might not rise with a constant rate of technological progress, provided the rate of population growth did not more than offset it. It is my belief, however, which I shall have to support in a subsequent paper, that these models can be applied to underdeveloped countries as well. "Capital-scarcity" countries are by no means "excess-investment" countries, and the problem of achieving steady growth in underdeveloped countries no less than advanced ones is essentially one of generating a sufficiently high rate of *increase* in net investment. For this purpose a steady and sufficiently high rate of *increase* in growth factors, such as technological progress and resource discovery, is needed. In other words, underdeveloped countries suffer from *both* capital scarcity and a deficiency of effective demand. Unless net investment grows, technological progress will generate increased unemployment rather than higher incomes.

progress might be very high indeed.[12] Once this catching up period is over, the problem of *increasing* the rate of technological progress still further will be a serious one indeed; but this problem is one which need not worry us for some time.

There are, nevertheless, problems with regard to increasing the rate of technological progress in underdeveloped countries. A high rate of technological advance requires both inventions and innovations. That is, it requires the discovery of new techniques and also their successful introduction into use. The introduction of inventions into use, or innovations, is the very essence of entrepreneurship. Unfortunately, most underdeveloped countries are lacking in indigenous entrepreneurship. In Europe prior to the Industrial Revolution the ideological changes accompanying the Reformation created attitudes favorable to enterprise. The entrepreneurial spirit was enhanced by the opportunities presented by the enclosure movement, the discoveries, and the expansion of world trade. In contrast to this upsurge of enterprise is the feudal attitude towards commerce and industry which still prevails in many underdeveloped countries. In these countries today, as in Europe generations ago, the gentleman does not sully his hands in trade. Nor is innovation sufficiently respected and rewarded in most of these societies.[13]

True, the government may replace private enterprise as innovator. But as Dr. Singer has pointed out,[14] there are disadvantages of government enterprise for development of underdeveloped countries. Most underdeveloped areas are very short of trained people at top levels of government. If these people concentrate on development problems, they may neglect the regular duties of government. The result will be bad administration, which is one of the main barriers to economic development. As Singer indicates, we are confronted here with another of the vicious circles so frequently encountered in this field. It takes good administrators to improve administration.[15] Moreover, Singer argues, it is disadvantageous for economic development policy to be mixed up with nationalism and with local politics.

There are other economic problems connected with the generation of a high rate of technological progress. Rapid technological progress requires not only entrepreneurship of the Schumpeterian type but also managerial, technical, and labor skills. Unfortunately, the underdeveloped countries are short of all these things as well. Insofar as technological progress consists of adaptation of techniques or introduction of commodities already known in the West, there are several disadvantages. While this process may permit a high rate of technological advance at first, the "leverage effects" may be low. The "geographic multiplier effects" will be felt very largely outside

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[12] Throughout this section the term technological progress is used to mean a change in the production function of the country concerned, of a kind raising productivity, rather than an advance in (world) technical knowledge.

[13] The reader may miss here some reference to the contrast between the effect of the Reformation on attitudes towards economic and social change and the "retarding force" of "stagnant religious ideologies" in underdeveloped areas. The reference is not made because in this case I am not sure that the contrast exists. Something seems to be going on within Islam that is not dissimilar to the earlier Reformation within Christianity, and even Hinduism seems capable of great flexibility in the economic and social spheres. May I be permitted to reserve judgment on this score?

[14] Hans Singer, "Obstacles to Economic Development," *Social Research*, Spring 1953.

[15] The Japanese experience is hard to assess because of the role of armament, war, and defeat in Japan's recent history. However, it appears that Japan's industrialization raised per capita income only from about $100 to about $150 per year up to the middle 1930's when it began falling again; and industrialization was accompanied by little or no agricultural improvement. The whole program failed to launch a process of cumulative growth. At the very least, the record of Japan should be carefully studied for the light it may throw on limitations of government-sponsored economic growth.

the country, rather than inside it, as was the case where new techniques were developed in the same country as that in which it was applied. If the top management and technicians are brought in from abroad—and it is difficult to imagine how western techniques could be introduced quickly otherwise—the process may not become cumulative or self-sustaining, since an indigenous class of top managers and technicians may not develop quickly. Most underdeveloped countries have balance of payments problems, and the importation of capital equipment, in order to take advantage of superior techniques of the Western World, may result in a temporary deterioration of this balance that can be ill-afforded. The advanced countries now have a virtual monopoly of scientific and industrial research which is not directed towards the special problems and the factor endowment of underdeveloped countries. Finally, modern technology is of a type which results in rapid and often unforeseen obsolescence which only advanced countries, with a high ratio of savings and investment to income, can afford.[16]

Despite these limitations, it is a rapid rate of technological progress that offers most hope of economic development of underdeveloped areas.

Importance of Conjuncture of Economic Factors. In this connection, it may be well to reiterate the point made at the outset of this paper; the extraordinary advance of Europe during the Industrial Revolution, and of the New World in the nineteenth and twentieth centuries, was the result of a favorable conjuncture of all these economic forces. Population grew from levels below optimum, so that population growth constituted a further stimulus to expansion. Popula-

tion growth was accompanied by migration to areas which were even richer in natural resources than those which were left behind. These two factors were accompanied by a rapid rate of technological progress which encouraged search for other types of resources and brought new population movements. Population growth also provided additional demand for the new products for increased output, and prevented capital accumulation from out-running the labor supply. Together with resource discoveries, the growing labor force prevented diminishing rates of profit.

While there are barriers to a rapid rate of technological progress in underdeveloped countries, the achievement of such a rapid rate of technological progress is not impossible. What seems impossible is the achievement of the same favorable *conjuncture of all the economic factors* which was enjoyed by the Western World during its period of most rapid economic progress.

Chronic Potential Inflation. One final economic factor might be mentioned. While it is probably not true to say that underdeveloped areas universally suffer from chronic inflation, it is true that most of them suffer from chronic potential inflation. Underdeveloped countries have typically low levels of both savings and investment so that stagnation rather than inflation is the normal state of affairs. However, the situation is such that any favorable development which results in a sudden increase in developmental investment, whether from public or from private sources, is accompanied by a lag in savings. The result is inflation, in the sense of a rising price level, *unless* the investment is of a kind that increases output as much as money income by absorbing unemployment or excess capacity. Inflation at rates likely to become cumulative is a drag on economic

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[16] This statement needs qualification in one respect. The rate of obsolescence of given techniques may be slower in low-wage countries where less competitive advantage is gained by introducing a more labour-saving device.

expansion. It tends to aggravate the tendency, already too common in under-developed areas, to make speculative investments in inventories rather than investments in productive enterprises.

II. Political Factors

Political as well as economic factors combined to create an atmosphere conducive to economic development of the Western World in the eighteenth and nineteenth centuries. These favorable factors may be divided into two main categories: the politics of the technically superior country during the period and the politics of the relatively underdeveloped areas at the same time.

Politics of Technically Superior Countries. During the eighteenth century, economic development was largely a matter of developing new industries and areas within the geographic area subject to control by the government concerned. The political advantages of this sort of development are too obvious to need stressing here. It will be more fruitful, therefore, to compare the politics of the technically superior countries during the nineteenth century—when the United States, Canada, Australia, and the New World generally enjoyed rapid growth—with the politics of the technically superior countries today. During the eighteenth and nineteenth centuries the technically superior countries were the United Kingdom, France, Holland, and Germany. For simplicity and conciseness, however, we shall concentrate our attention on the United Kingdom. Similarly, the technically superior countries today are the United States, Canada, the United Kingdom, and possibly Australia, Switzerland, Sweden, Germany, Belgium, Holland and France; but we can usefully concentrate on the policies of the United States because of its overwhelming importance in the world economy.

Let us first consider foreign trade policy. During most of the period under consideration the United Kingdom followed a policy of free trade. There were, of course, good reasons for this. The United Kingdom enjoyed a competitive advantage in the sale of its manufactured goods and in the purchase abroad of agricultural raw materials and foodstuffs. The United States has followed a high tariff policy rather than a free trade policy. The example provided by the leading industrial nation of today bolsters protectionist sentiments elsewhere. The difficulties in marketing their output of raw materials and foodstuffs because of the protectionist policy pursued by the United States (and other industrialized countries) may be a retarding influence on the economic development of the now underdeveloped areas.

Perhaps more important, the United Kingdom was also a heavy importer. After 1825, the United Kingdom's balance of trade in commodities became unfavorable. From 1873 on, its balance of trade in goods and services was unfavorable and Great Britain was receiving large amounts in interest and repayments, as became a country which had made heavy investment abroad.[17] Not only was the balance of trade unfavorable, but the value of imports was high relative to national income, probably averaging some 25 percent. The United States, by contrast, is not only a high tariff country, but has consistently maintained favorable balances of trade in recent years. Moreover, its imports are a very small fraction of gross national income, averaging less than 5 percent. Relative to the scale of its own economy and of the present-day world economy, the United States is providing a much less advantageous market for the products of under-

[17] Cf. A. E. Kahn, *Great Britain in the World Economy* (New York: Columbia University Press, 1946), esp. Ch. VIII.

developed areas, with respect both to the balance and to the volume of trade, and perhaps with respect to the terms of trade as well.

Similar contrast appears with respect to foreign investment. Professor Cairncross has recently estimated that if the United States were to lend abroad on a scale equivalent in terms of *per capita* real income to that reached by the United Kingdom during the nineteenth century, the United States would now have $600 billion of foreign investments on which it would earn some $30 billion a year.[18] In other terms, to match the flow of capital from the United Kingdom in the nineteenth century relative to *per capita* real income, the United States would have to carry out the entire Marshall Plan twice every year. The scale of foreign aid and investment would need to be increased tenfold. There was no "chronic shortage of sterling" during the period of rapid growth of the United States, Canada, and Australia but there is a "chronic shortage of dollars" today.

It has been suggested that the large scale of British foreign investment in the nineteenth century, while dictated largely by private economic interests, was consistent with domestic government policy. The French Revolution instilled a deep-seated fear in Britain's elite and a feeling that the masses deserved—or might insist upon—more consideration than they had received in the past. There was therefore a wish in high places to obtain cheap food. Frontier developments using British capital made the cheaper food possible. Thus, apart from the immediate economic interest in developing underdeveloped countries through large-scale foreign investment, there was a more subtle political purpose.

Finally, the technically superior countries were able to enforce stability in

underdeveloped areas if need be. Originally, as pointed out above, the "underdeveloped areas" were within their own borders. Later, colonies assumed paramount importance. Later still, the United States and Dominions became major recipients of foreign investment. Perhaps it was less easy for the United Kingdom to police her investments in the Dominions than it was in her colonies and less easy in colonies than within their own borders; but it could hardly be denied that the superior military force of the United Kingdom was a factor in promoting confidence among investors. The technically superior country, the United States, has much more difficulty in exercising physical control in the underdeveloped areas today if only because it is not the only great power interested in exercising control over these areas. During the nineteenth century the technically superior countries were confronted with no major enemy interested in general unrest in underdeveloped areas. There was rivalry among the United Kingdom, France, Holland and Germany, but they had a common interest in maintaining political stability in the underdeveloped areas in general. Today the situation is entirely different. One set of powers has a distinct interest in fomenting unrest in underdeveloped areas. Efforts of the technically superior country to enforce stability in these areas may only drive these areas into the enemy camp. This fact naturally affects the attitudes of potential investors in the technically superior countries, whether private or governmental, towards investment in the now less developed areas. Meanwhile, the limited amount of Russian capital and expertise available for development abroad is allocated to her own satellites.

Politics of Underdeveloped Areas. In sharp contrast to the situation in present-day underdeveloped areas, in the New

[18] A. K. Cairncross, *Home and Foreign Investment, 1870-1913,* (Cambridge: Cambridge University Press, 1953), p. 3.

World during the eighteenth and nineteenth centuries, nationalism seldom took a form antipathetic to foreign capital. Even in the United States, which won its independence from the British Empire through a revolution, nationalist feeling imposed no serious obstacles to a large and continuous flow of British capital into the country. In the colonies, and even in areas which were not legally colonies at all, forced labor and expropriation of property played their roles in economic development, as Professor Bronfenbrenner has pointed out.[19] How different is the situation in the underdeveloped countries of today, most of which are now sovereign nations! Far from being able to force labor or expropriate property, the foreign investor is more apt to find himself at the mercy of powerful trade unions backed by government arbitration boards and threatened with appropriation of his property, or at least by import restrictions, immigration restrictions and foreign exchange controls which are tantamount to expropriation. In many underdeveloped countries of today, risks of unpredictable and injurious government action, often based on nationalist sentiment, are added to the normal risks attendant upon investment abroad.

Moreover, in the New World of the eighteenth and nineteenth centuries, development was undertaken mainly by and with people from the investing countries themselves. As Professor Cairncross has demonstrated, capital and labor flowed together from the Old World to the New.[20] The emigrants who provided the management and the labor force for foreign undertakings spoke the same language and represented the same culture as those providing the capital. This situation naturally led to a higher degree

of confidence in foreign investment than can be expected where governments insist on use of nationals of a culture alien to the investor as they do in many of the present underdeveloped areas. For the same kind of reason, search for new natural resources by foreign capitalists was more attractive in the New World in the eighteenth and nineteenth centuries than it is in most underdeveloped areas today. There were then no problems with regard to transfers of profits when earned, or with regard to personal and corporation income taxes, visas for managerial and technical personnel, land leases, and the like. These same conditions facilitated a higher rate of technological progress since the movement of capital was usually accompanied by a transfer of skills and of technical knowledge.

Another aspect of the internal policies of the underdeveloped areas which is inimical to rapid development is insistence on early introduction of a full-fledged welfare state. In the now advanced countries the welfare state appeared only after generations of industrialization. In the present underdeveloped areas the usual policy seems to reverse this process. Most of these countries want the blessings of the welfare state today, complete with old age pensions, unemployment insurance, family allowances, health insurance, forty-hour work-week, and all the trimmings. Similarly, trade unions became powerful in the now advanced countries only after considerable industrial development had already taken place. The statistics are none too good and have given rise to some controversy; but it seems likely that the material standard of living of European wage-earners *declined* in the first stages of the Industrial Revolution. In terms of actual welfare, the industrial slum dweller in eighteenth century England

[19] Cf. Martin Bronfenbrenner, "The High Cost of Economic Development," *Land Economics*, May 1953, pp. 98-99.
[20] Cairncross, *op. cit.*, esp. Chs. III and VIII.

was almost certainly worse off than the peasants who were their forebears—and perhaps worse off than the Indonesian *tani* today. It appears that real wages in Japan also fell during the first phase of its industrialization program.

Many of the now underdeveloped areas, on the other hand, are encouraging the development of trade unionism in advance of industrialization. In some countries the trade unions, backed by governmental arbitration boards, are demanding higher wages, shorter hours and "fringe benefits" which do not reflect any commensurate rise in man-hour productivity. Especially where the employer is a foreigner, trade union members are nationals, and nationalistic sentiments run high because of recent releases from colonialism, governments are hard put to it to support employers against trade unions, even where economic development is adversely affected by crippling demands. Too few of the trade union leaders of underdeveloped countries have learned the hard lesson that a higher standard of living for labor as a group requires higher productivity of labor as a group.[21]

Finally, as Professor Hansen has suggested, the fiscal systems of most Western

[21] For analytical completeness, a distinction should be made between such measures as reduction of the working week which lower man-year productivity directly, and "transfer payments" such as old age pensions, unemployment insurance, family allowances, etc. which do not. Social welfare outlays of the "transfer payment" type reduce output only if they reduce the supply of effort—which they may do—and exert inflationary pressure only if they redistribute income from savers to spenders, which they may also do. However, the "transfer payment" category of welfare expenditures is probably more important as a symptom of attitudes antithetical to rapid economic expansion in the early phases of industrialization than as an actual barrier to economic growth. They reflect a feeling, all too common in underdeveloped countries, that their governments can "legislate prosperity," that adoption of the social legislation of economically advanced countries will make underdeveloped countries prosperous even without direct action to attain more closely the high productivity of the advanced countries. On the other hand, it must be recognized that by improving health and welfare in impoverished countries, or just by providing new hope, social legislation may *raise* productivity.

countries in the early stages of industrial development were such as to redistribute income from poor to rich.[22] Taxes consisted almost entirely of customs and excise duties, which fell relatively heavily on the poor, who spent most of their incomes for consumers' goods. Income and inheritance taxes were unknown. Government expenditures, moreover, were of a type benefiting mainly the upper-income groups—interest on government bonds, subsidies to private enterprise, transport facilities, and the like. However reprehensible these fiscal systems may have been from the social viewpoint, they added to the flow of savings and investment and thus accelerated economic development. Most underdeveloped countries today want exactly the opposite kind of fiscal system with progressive income and inheritance taxes and social security expenditures designed to improve the distribution of income and wealth. Laudable as these policies are on social grounds, they tend in themselves to reduce the flow of savings and investment and so to retard economic growth.

III. Sociological Factors

Sociological factors, as well as economic and political, conspired to favor rapid economic growth of the Western World in the eighteenth and nineteenth centuries. There is a whole literature designed to show how the Reformation raised the propensity to save. The byword of Puritanism was "earn what you can, but save what you can." This attitude helped to produce a flow of savings sufficient to finance the introduction of new commodities and new techniques brought by the Industrial Revolution. This attitude is lacking in most of the underdeveloped countries today. Not only are these countries poor, so that

[22] Alvin Hansen, *Fiscal Policy and Business Cycles* (New York: W. W. Norton & Co., Inc., 1941), Chs. VI and IX.

large volumes of savings entail real sacrifices, but both the propensity to consume and the propensity to import are high in all income brackets. Initial increases in income which might be generated by a development plan are likely to be dissipated in higher levels of consumer spending. Moreover, there is a desire in these countries, especially in urban centers, to emulate the Western Nations with regard to consumption. Unless policy is specifically designed to prevent it, a large share of increases in income tends to be spent on imports. An initial increase in income fails to produce significant increases in savings and it leads to a deterioration of the balance of payments unless prevented from doing so by policy. Unfortunately, this "spirit of emulation" is stronger in the field of consumption than it is in production. The value systems of underdeveloped areas do not seem to be incompatible with a desire for the goods of the Western World; but they do not appear to generate a strong impetus to duplicate the quantity and quality of work which have produced the higher standard of living in the West.

A second contrast, which need not be labored for economic historians, is that present efforts in underdeveloped areas attempt to achieve geographic and occupational shifts on a voluntary basis, whereas in Europe these shifts were forced with drastic effects, by the enclosures. However undesirable the social effects of the enclosures may have been, they were a very effective device for moving people out of agriculture into urban industry. The lingering attachment to the village way of life in many of the underdeveloped areas makes industrialization of these countries more difficult to achieve. Either the village structure must break down or a technology discovered that will permit *efficient* industrial production *within* the village structure.

Another factor in the sociological field is the problem of incentives in a society organized around the undivided family. The rapid expansion of the European economies in the eighteenth century and of the New World economies in the nineteenth was based on a social system organized around immediate-family units. Whatever the merits or demerits of this system from other points of view, it was an effective one from the standpoint of economic incentives. The social unit concerned in a choice between income and leisure, between consumption and saving, between a larger family and a higher living standard, was the social unit that derived the immediate benefit from it. If a man worked overtime for extra pay, his own immediate family benefited from his decision. If he decided to have a small family, he could be reasonably sure that he could provide a better life for his family than if he had a larger one. If he saved money, it was his own children who benefited from his sacrifice. In the enlarged family system prevalent throughout much of the Eastern World, this consistency between the decision-making social unit and the benefiting social unit does not exist. The man who works harder than others may merely find himself taking care of a larger number of distant relatives, while his own children benefit little from his extra effort. If he limits the number of his own children, he may only be obliged to take care of a larger number of nephews and cousins. His savings may be regarded as at the disposal of the enlarged family unit as a whole and not for his own wife and children alone. Under these conditions, the incentive to work harder or longer, to save, and to practice birth control is obviously much diluted. Either the

social organization must change or the basic choices must be presented in a different fashion so that the social unit that makes the decision will itself derive any benefit that accrues from it.

A final sociological factor is the "backward sloping supply curves" of effort and risk-taking in underdeveloped countries. Virtually all observers of the behavior of the people of these countries point to the difficulty of encouraging additional effort, or additional risk-taking, by the promise of higher money income. I am not one of those who with Professor Boeke,[23] believe that the people of underdeveloped areas are fundamentally different in their motivation from those of advanced countries. The "backward-sloping supply curve" can be found even in the most advanced countries. I do believe, however, that stagnation is self-reinforcing. At whatever level stagnation sets in, it has the effect of converting upward-sloping supply curves of effort and risk-taking into backward-sloping curves. To have an incentive to work harder or better or to take additional risks with one's capital, one must have a clear picture of the use to which additional income is to be put. A strong "spirit of emulation," or a high "demonstration effect," occurs only where some people are actually demonstrating the effects of additional effort or risk-taking. "Keeping up with the Joneses" is a dynamic force only when the Joneses are moving from one standard of living to a higher one. If life in the village has been much the same for generations and no one in the village has before them the picture of people moving to ever-higher standards of living through their own efforts or their own willingness

to risk capital, the expenditure of additional effort or the acceptance of additional risk is apt to seem rather absurd. Here is still another of the vicious circles so common in the field of development of underdeveloped areas; a progressive society inculcates attitudes and provides incentives favorable to economic growth; a stagnant one does not.

This analysis may appear inconsistent with the argument made above with respect to the high marginal propensity to import, but actually it is not. If national income rises for some extraneous reason, such as increasing export prices, people will wish to spend a large share of the increased income on imported semi-luxuries. But the villagers see no easy way of raising their income through their own efforts or initiative because they do not have before their eyes enough examples of people succeeding in doing so. Thus their wish for imported semi-luxuries need not provide an effective incentive for additional effort and risk-taking. Still another vicious circle! The "spirit of emulation" is necessary to provide incentives to harder and better work and increased enterprise but, if it takes the form of a wish for imported semi-luxuries, it aggravates balance of payments problems.

IV. Technological Factors

Finally, technological factors were more favorable to development in the Western World during the eighteenth and nineteenth centuries than they are in the underdeveloped countries today. The simplest of these technological factors is the extent of the resource endowment. If one compares the United States or Canada with Libya or East Pakistan in terms of the per capita resource endowment, the contrast is apparent. In countries like Indonesia where there is great diversity of resources, the contrast

23 J. H. Boeke, *Economics and Economic Policy of Dual Societies* (New York: Institute of Pacific Relations, 1953), esp. pp. 39-41, 36-52 and 100-112. For a critical analysis of the Boeke thesis see Benjamin Higgins, "The 'Dualistic Theory' of Underdeveloped Areas," *Ekonomi dan Keuangan Indonesia*, February 1955.

is less clear; some observers have spoken of Indonesia as a country "rich in natural resources." However, closer examination of the Indonesian resource picture in terms of the extent and quality of resources in relation to her population of 80 million people suggests that, while Indonesia is certainly better off than many of the underdeveloped areas, she is far from being as blessed in natural resources as most of the now advanced countries.

Moreover, in the underdeveloped countries the present factor endowment, in terms of proportions in which land, labor, and capital are available, is a drag on development. The very essence of economic development is a fall in the ratio of agricultural employment to total employment. But the proportions in which factors of production are available in underdeveloped areas favor agriculture against industry: labor is abundant—even redundant—land is relatively limited, while capital is very scarce. Agriculture is a field in which relatively good results can be obtained by labor-intensive techniques, with much labor and little capital applied to available land. Industrialization with known techniques requires a much higher capital-labor ratio.

Some recent analysis suggests that the techniques which would maximize total value output in underdeveloped countries, even assuming that enough capital was available to introduce them, would not provide full employment.[24] Here is a dilemma; unemployment is a serious social phenomenon. Yet maximum value product is needed not only to raise standards of living at the moment but to permit a ratio of savings and investment

to income which would generate continued economic growth.

Unfortunately, technological research has been carried on mainly in countries where labor is a relatively scarce factor. Technological progress is regarded as a synonym for labor-saving devices. Little scientific endeavor has been directed towards raising production in countries where capital is scarce and labor abundant and where consequently labor-saving devices make little sense. No advanced technology has yet been discovered which is suited to the factor proportions of underdeveloped countries. Perhaps such a technology does not exist but it is important to find out. Meanwhile, the lack of technological advance adapted to their factor proportions is a serious obstacle to development of underdeveloped areas—an obstacle that scarcely existed in the Western World during its Industrial Revolution.

A related technical problem is the apparent discontinuity in the production function with respect to capital supply. Certain types of production process are inefficient unless carried on at a minimum scale which is itself large in terms of capital requirements. In Indonesia, for example, one of the most hopeful projects on the horizon is the complex of power, aluminum, fertilizer and related industries constituting the Asahan program. A project of this kind runs into hundreds of millions of dollars yet it is no worth undertaking on a small scale.

Moreover, there is evidence accumulating to suggest that raising *per capita* income by a given percentage amount requires a larger percentage addition to the stock of capital in underdeveloped countries than it does in advanced countries. This difference reflects partly the extremely high capital cost involved in provision of social capital, such as housing, community facilities, public utilities,

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[24] Some of this analysis has been developed at the Center for International Studies, mainly by Dr. Richard Eckaus. His results are summarized, and applied to the Indonesian model, in Benjamin Higgins, "The 'Dualistic Theory' of Underdeveloped Areas," *loc. cit.*

and transport, as industrialization takes place. Even in agriculture, however, the "incremental capital output ratio" may be very high where land reform is necessary involving shifts to new types of agriculture or where expansion requires land reclamation, jungle clearance, and the like. Here is still another vicious circle. Advanced countries can add to their *per capita* income with a smaller (percentage) sacrifice of current income than can underdeveloped countries.

It has been suggested that the solution to this problem is capital-saving inventions. However, it is essential to make a distinction between capital-saving inventions and capital-saving innovations. Probably most inventions are capital-saving in the sense that they reduce the capital required per unit of output, once the new plant is in place. In this sense, it seems likely that even the steam railroad was a capital-saving invention; capital required per ton-mile of freight carried is probably less on a modern railway than it was with horses and wagons. However, capital-saving inventions of this type do not help very much if the capital requirements for *introducing* them are beyond the means of underdeveloped countries. In other words, the *installation* of a new technique that may ultimately be capital-saving may require very large amounts of capital indeed. Even capital-saving inventions are easier for advanced countries to introduce than for underdeveloped ones. Where a great deal of capital has already been accumulated, capital-saving inventions can be introduced by using existing replacement funds. Where the capital stock is low, however, replacement funds will be insufficient for major innovations even if they consist in introduction of capital-saving inventions. What underdeveloped countries need is

not merely capital-saving inventions in this sense but means of raising productivity without increasing the current rate of total investment, *even temporarily*. Clearly, the technical requirements of this sort of innovation are much more severe than for capital-saving inventions of the usual sort.

There is also a problem of scale, or a discontinuity, on the side of demand. As Dr. Rosenstein-Rodan has pointed out, the establishment of a shoe factory may prove unprofitable in an underdeveloped country since so small a share of the income created by investment in a shoe factory will return to the producer of shoes. Only large-scale expansion, consisting of development of a few industries of very large scale or of a great many small-scale industries, will raise income sufficiently to generate significant increases in demand for all commodities.

Moreover, there is reason to suspect that a collection of small industries has lower "leverage effects" than a single large one involving the same initial amount of total investment. The construction of a railway, opening up new territory, facilitating population movements, and making necessary the development of new communities, is likely to have a greater aggregate effect on investment than a collection of shoe factories, textile plants, and the like, even if the initial investment is equally large in both cases. Again we are confronted with a vicious circle. It is difficult to industrialize without the increases in income which would provide the demand for increased output of industrial goods; but such increases in income are difficult to achieve without industrialization.

V. Conclusions: An Impossible Task?

In our whole review of strategic factors in economic growth, we have discovered only one with respect to which the now

underdeveloped areas have a comparative advantage over the Western World of the eighteenth and nineteenth centuries.   All underdeveloped countries have a large sector of their economies in which the majority of their peoples are occupied with levels of technique and skill far below that of the advanced countries or of the more advanced sector of their own economies. There is accordingly an opportunity for a high rate of technological progress through the application of the most advanced technical knowledge available to the underdeveloped sector.   Even this advantage, however, is a doubtful one; the equipment and technical skills that have been so effective in raising levels of productivity in the West are largely inappropriate to the factor proportions of underdeveloped countries.   While labor-saving devices can raise the total value of output in underdeveloped countries, they may do so at the cost of adding to the pool of disguised   unemployment.   In   every other respect the now underdeveloped countries seem to be at a disadvantage, as compared to Europe and the New World at the beginning of their periods of rapid economic development.

Must our conclusions be that the task of developing the now underdeveloped areas is an impossible one?   My own answer to this question is: Not if both the underdeveloped countries and the advanced countries agree on the necessity of economic development of underdeveloped areas, understand what is required to obtain this development, recognize the magnitude of the task, and accept it nevertheless.

The technical assistance program mentioned in our opening paragraph can contribute significantly to the solution of the problem.   Economic development of underdeveloped areas clearly require better selection of methods, equipments and materials.   It also requires manpower training including the training of managers and foremen as well as of industrial and agricultural workers.   Experts from the Western World with knowledge of the most advanced techniques of production and of private and public administration can help to raise productivity in underdeveloped areas. But it is apparent from the foregoing review of strategic factors of economic development that technical assistance will have little effect unless combined with a greater receptivity in underdeveloped areas and with a much larger scale of net capital formation.

A second conclusion is that capital formation is unlikely to take place at a pace rapid enough to get underdeveloped countries "over the hump" unless the responsibility for net investment is shared by underdeveloped and advanced countries as it was in the case of most countries in the past.   Clearly, the development of underdeveloped areas is primarily the responsibility of the underdeveloped areas themselves.   The economic progress of the now advanced countries required great sacrifices on the part of some groups in those countries in the past. Our review of the comparative situation of the now underdeveloped areas indicates that their development will require still greater sacrifices although one might hope that the sacrifices will be better distributed.   The advanced countries in turn must recognize that no feasible effort and sacrifice on the part of underdeveloped countries is likely to be sufficient to get these countries "over the hump."   In the first phases of economic development, much larger-scale capital assistance from advanced countries will be necessary.

Land-to-the-Tiller Policy and Its Implementation in Formosa

By HUI-SUN TANG* and JEN-LUNG CHEN**

FORMOSA is a rich agricultural province of small holdings and is densely populated. There are 850,000 chia (one chia is equal to 2.3968 acres or 0.9699 hectares) of arable land which is distributed among 660,000 farm families, each of which cultivates on an average only 1.3 chia. Of the 660,000 farm families, 410,000 or 62% are either tenants or part-tenants. On the 170,000 chia of public land, all the cultivators are either tenant farmers or farm hands. Of the 680,000 chia of private land, 260,000 chia or 38%, are cultivated by 300,000 tenant families. Adding together the figures for both public and private lands, we find that of the 850,000 chia of arable lands in the Province, 430,000 chia or 50% of the total, are either under tenancy or are cultivated by farm hands. Although the tenanted lands are by no means concentrated in the hands of a few large landlords, yet the fact that 62% of its total farming population work as tenants on one-half of the arable area is not at all conducive to the economic program and social security of the Island.

In view of these conditions the Chinese Government instituted, beginning in 1949, a series of land reforms. The first step reduced the farm rental on 260,000 chia of private, tenant lands from an average rate of 50% uniformly to 37.5% of the total annual yield of the main crop and led to increased farm incomes for 300,000 tenant farmers. The second step in the reform movement was begun in 1950 and has continued up to the present. It was the sale of 63,000 chia of public

arable lands to 122,000 tenants; and still more lands of the same type will be sold to tenants in the future. Important as these two reforms are, they are merely preliminary to more comprehensive and thorough-going reforms. A land redistribution program was introduced by the Chinese Government in 1953 with technical and financial assistance from the Joint Commission on Rural Reconstruction (JCRR). This land redistribution program is known in Formosa as the "Land-to-the-tiller program."

I. Principal Features of the Program

Before the Land-to-the-Tiller Program went into effect in February 1953, two preparatory tasks had been undertaken by the Chinese Government to pave the way. The first was an overall classification of land ownership conditions in the Province. The survey which was supported with JCRR's technical and financial assistance and completed in one-and-a-half years, yielded six million land ownership classifications cards for use as basic material in the implementation of the program. The second was the enactment of the necessary legislation. The Provincial Government of Formosa drew up a draft of the land redistribution bill and submitted it on May 25 to the Executive Yuan for consideration. After careful consideration and discussion, the Executive Yuan passed the draft on November 12 and sent it on November 28 in the form of a bill to the Legislative Yuan for legislative action. Finally it was enacted by the Legislative Yuan on January 20, 1953. The program as enacted contains the following important features:

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(1) *On the Amount of Land to be Purchased by the Government and to be Retained by Landlords*. (A) The Act authorizes the Provincial Government of Formosa to purchase all excess holdings owned by private landlords and resell them to those tenants or farm hands who are present tillers of the land.

(B) Each landlord who owns tenanted land under individual ownership may retain three chia of medium-grade paddy field or six chia of medium-grade dry land. Lands exceeding that limit shall be purchased by the Government. However, ancestral worship bodies and religious institutions may retain tenanted lands twice the amount of those to be retained by individual landlords.

(C) Several landlords who owned tenanted lands under joint ownership shall be required to sell all their tenant holdings to the Government. However, the two following groups of joint landlords may retain their lands not exceeding three chia of the above description: (1) Joint landowners who are old and infirm, or orphaned, widowed, or disabled, and have to depend on incomes from land to support themselves. (2) Individual landowners who become joint owners by act of succession and share the joint ownership with husband or wife, or brother(s) or sister(s).

(D) If a landlord has, in addition to the land he leases to other persons, other pieces of land owned and tilled by himself, he can retain his tenanted land only up to a point where the acreage under retention plus the acreage under his own cultivation is just equal to the maximum which an individual landlord is entitled to retain. However, if the acreage of land under his own cultivation exceeds the maximum, he shall not be allowed to retain any portion of the land he has leased to others.

(2) *On the Transfer of Land*. (A) Lands subject to government purchase shall be first purchased by the Government from the landlords and then resold by the Government to farmers who are presently tilling them as tenants or farm hands.

(B) Purchased together with the land shall be those immovable fixtures such as farmhouses, drying grounds, ponds, fruit trees, bamboos, woods, etc. and sites thereof which are necessary to the land under government purchase and are used by its present tenant farmers.

(C) The purchase and resale of the lands shall be effected by transferring the ownership of the land from the landlords to the Government and then from the Government to the tenant farmer. Affected by the transfer shall be the legal title to the land only and not any physical change nor any sub-division of the farm holdings.

(3) *On the Purchase and Resale Prices*. (A) Both the purchase and resale prices are fixed at 2.5 times the total annual main crop of the respective lands according to their respective productivity grades. The total annual main crop has been previously fixed by the Farm Tenancy Committee which was composed of farmers, landlords and government officials to assist in the implementation of the rent reduction program.

(B) The price for the purchase of immovable fixtures on the land shall be appraised according to local practice by farm tenancy committees in each township and hsien.

(4) *On the Payment of the Purchase and Resale Prices*. (A) The Government shall pay to the landlords the purchase price 70% in land bonds redeemable in rice and sweet potato and 30% in government enterprise stock shares. The bonds shall be redeemed in 20 semi-annual installments spread over ten years plus a 4% interest per annum.

(B) The tenant purchaser shall pay to to the Government the resale price in rice and sweet potato in 20 semi-annual installments spread over ten years plus a 4% interest in kind per annum.

(5) *On Acreage of Land Purchasable by Tenant Farmers.* A tenant farmer may purchase all lands he leased from land-owners up to the point left by the portion which should be retained by landowners provided he can cultivate all these lands with his own labor.

(6) *On Farmer's Right of Ownership.* The tenant purchaser shall acquire ownership of the land he purchases after the payment of the first semi-annual install-ment of the purchase price to the Government. Farms acquired under this program may not be re-transferred by the tenant before the purchase price has been fully paid off.

(7) *On Farmers' Role in the Execution of the Program.* The Act authorizes that farmers shall assist the Government in the execution of the program. They shall participate in the execution through farm tenancy committees which are composed of tenants, owner-farmers and landlords elected by their respective groups in each township and hsien.

II. Implementation

The implementation of the Land-to-the Tiller Program in Formosa was carried out through a series of technical procedures. These procedures are as follows:

(1) *Ascertainment of Farm Lands Available for Transfer.* This involved the ascertain-ment of the names of all landlords who owned lands in excess of the legally pre-scribed limit and the names of tenants who were entitled to purchase such lands and then the area of land each of those landlords must sell and the portion each of those tenants was entitled to purchase. It was done by calculating all land holdings owned by one and the same landlord, by locating all the tenant farmers who cultivated those holdings and by computing the area to be trans-ferred to each tenant. There was also worked out, at this stage, name-lists of landlords who were entitled to retain the legally prescribed amount of land; of landlords whose land might be exempt from government purchase; and lists showing the areas of land to be retained by the landlords and to be exempt from government purchase. The records of 610,000 families of landlords and owner-farmers and 300,000 families of tenants were checked over and the necessary calculations and computations made and the results duly compiled into lists.

(2) *Check on the Actual Condition of Landownership and the Purchase Applications.* In order to ensure that the actual condi-tion of landownership might correspond with the records, an on-the-spot check was made to discover and correct any possible errors in the lists, to ascertain the true status of each landlord and tenant, and to invite purchase applica-tions from the qualified tenants. This was done by an extensive field investiga-tion of private lands tract by tract in all townships and villages. The work was carried out by 1,800 field teams under the leadership of trained workers assisted by 26,000 local persons. It was begun on March 15 and was completed on April 14, 1953. A total of 2,000,000 plots of private farm land was investigated, and the results of the investigation were care-fully recorded for use in determining transfer and retention acreages.

(3) *Screening and Public Announcement of the Land Transfer Lists.* To make sure that the status of the landlords and tenants was accurately determined and the areas for transfer and retention were just and fair, the above lists were further subjected to a screening process which was done chiefly by the 315 township

and 22 hsien or city governments. Generally speaking, the farm tenancy committees screened the resale and retention lists and the hsien or city governments screened the purchase and exemption lists and decided whether or not the lands as listed should be retained, transferred or exempted from purchase. The farm tenancy committees might approve, reject or revise the lists. When the screening was completed, the purchase and resale lists were then posted before the 315 township offices for inspection by the landlords and tenants concerned, who might request corrections within one month of the public announcement if any error should be found in the lists. At the end of one month the status of these landlords and tenants and the areas for transfer as shown in the lists became definitive and the lands listed therein were ready for transfer.

(4) *Transfer of Land.* The transfer of lands marked the last step in the execution of the program. This was done by first notifying both landlords and tenants concerned of the category, area, and location of the lands to be transferred, of the amount of purchase and resale prices, and of other procedures to be complied with. The landlord then surrendered his title deed to the local Land Office which issued him a receipt therefor. Next, he went to the local Land Bank to claim the compensation for his land in the form of land bonds and industrial stocks on the presentation of the receipt. On receiving the transfer notification the tenant first went to the local land bank to pay the first installment of the purchase price for the land transferred to him and the bank issued him a receipt therefor. Then he proceeded to the local Land Office to get the landownership certificate on the presentation of the receipt.

The land transfer work was carried out by the Provincial Land Bureau through 6,537 village offices, 333 township offices, 59 land registration offices, 22 hsien governments and 341 hsien and township farm tenancy committees in the Province during the 6-month period from February 1 to July 31, 1953, by a total of 33,110 field workers including supervisory and technical personnel. The field work done during this period included the investigation of the entire 680,000 chia of private farm lands, 550,000 of part-owners and tenants thereon, and the compilation of 3,660,000 sheets of investigation tables.

III. Land Transferred and Tenants Benefited Under the Program

The Land-to-the-Tiller Program was launched by the Provincial Government of Formosa on February 1, 1953. One year was set as the period within which the whole program should be completed. As of December of that year, major program work such as training of workers, field investigation of private holdings, transfer of tenanted lands from landlords to tenants, issuing of land bonds and redemption of the initial installment, distribution of industrial stocks of government enterprises, and collection of the first installment payment of the land purchase price from farmer purchasers, were practically all completed by the Government, leaving only the adjustment of land title records and the transfer of the industrial enterprises to be done after the turn of the year. Rarely has it happened in Chinese history that a program of socio-economic reform was executed and carried out in so short a period and in so speedy a manner.

In the course of the program execution, several estimates on the possible area of tenanted land available for transfer had been made to measure the possible effects of the program. The first estimate made on the basis of the draft prepared by the

Provincial Government was 215,000 chia. The second estimate made according to the draft approved by the Executive Yuan was 179,000 chia. After the bill was enacted by the Legislative Yuan and the land transfer was carried out in August 1953, it turned out that a total of 143,000 chia was actually transferred from 106,000 landords to 195,000 tenants and part-tenants under the program. Each of the 195,000 tenant families acquired an average farm of 0.7 chia in either paddy field or dry land or both. These tenants represent about 50% of the total tenant population in the Province. On the other hand, landlords affected by the program total 106,000 families which represent about 17% of the total landowning population in the Province. The tables which follow indicate other effects of the reform program.

Table I shows the size of land acquired by the tenant purchasers according to classification and percentage of total area and total number of families.

TABLE I—Size Classification of Land Acquired by Tenant Purchasers by Percentage of Total Area and Number of Families

Size Class: Chia	Area Purchased	% of Area	Purchaser Families	% of Families
Below 0.5	23,830	16.60	91,980	47.21
0.5-1.....	40,590	28.27	57,166	29.34
1-2.......	47,377	33.00	34,665	17.80
2-3.......	18,304	12.75	7,721	3.96
3-5.......	9,955	6.93	2,735	1.41
Over 5....	3,512	2.45	556	0.28
TOTAL..	143,568	100.00	194,823	100.00

Table II shows the size of farms operated by tenant purchasers after the reform, according to classification and by percentage of total area and total number of tenant families. They include part-tenants who also till some land owned by themselves, as well as those who are full-time tenants. Farms tabulated here include: (1) land acquired under the Land-to-the-Tiller Program, (2) land leased from landlords, (3) land leased from the Government, and (4) land owned by the farmers themselves. The tenants are again of two types: those cultivating lands leased from private owners and tenants cultivating lands leased from the Government.

TABLE II—Size of Farms Operated by Tenant Purchasers After Land Reform by Percentage of Area and Number of Families

Size Class: Chia	Area Under Operation	% of Area	Purchaser Families	% of Families
Below 0.5	17,213	8.35	60,442	31.02
0.5-1.....	40,818	19.81	56,695	29.10
1-2.......	75,699	36.74	53,460	27.44
2-3.......	39,312	19.08	16,261	8.35
3-5.......	24,208	11.75	6,640	3.41
Over 5....	8,788	4.27	1,325	0.68
TOTAL..	206,038	100.00	194,823	100.00

Land Tenure Conditions After the Reform. In June 1952 there was in Formosa a total of 680,000 chia of private cultivated lands of which 260,000 chia, or 38% of the total, was cultivated by tenants. The Land-to-the-Tiller Program transferred 159,000 chia of these tenanted lands into owner-farms and increased the area under owner-cultivation for the Province as a whole from 419,000 chia to 578,000 chia, or 85% of the total, thus reducing the area under tenancy to 15%.

Of the 159,000 chia converted into owner-farms under this program, 143,000 chia were transferred to tenants by the Government. The remaining 16,000 chia were purchased by tenants directly from their landlords during 1953. The direct purchase by tenants of these 16,000 chia represents a coincidental achievement of the reform. These lands would have been sold by landlords to tenants if the Land-to-the-Tiller Program had not been launched by the Government. The following tabulation shows the land tenure situation before and after the reform:

A. *Area Under Farm Tenancy*
Total privately-
owned land.....681,154 chia..100.0%
Total tenanted
land before
reform.........262,251 chia.. 38.6%
Total tenanted
land after reform 103,473 chia.. 15.2%

B. *Farm Families Under Tenancy*
Total families on
privately-owned
land: including
tenants and
owner-operators.566,270......100.0%
Tenant families
before reform...311,637...... 55.0%
Tenant families
after reform.... 149,282...... 26.4%

IV. *Payment of the Land Purchase Price by the Government*

To pay the purchase price of the 143,000 chia of private, tenanted lands purchased under the program, the Chinese Government employed two unique instruments, namely, land bonds in kind and industrial stocks of government enterprises. The land bonds in kind were designed to preserve the value of the amortization payments intact against possible inflation during the 10-year period following the purchase and to save the Government the necessity of resorting to the printing press for raising the purchase fund and thus to eliminate the danger of inflation. The industrial stocks were to mobilize a part of the private capital hitherto tied up in land by diverting it to the more dynamic field of industry to achieve a higher degree of production in the Province and to stimulate the development of private industry on the island by transferring some of the government enterprises to private ownership.

1. *Issuance of Land Bonds.* Rice and sweet potato are the two principal farm products in Formosa. Rice is raised on paddy field and the sweet potato on dry land. To meet this agricultural condi-

tion, two kinds of land bonds were designed and issued: the rice bond and the sweet potato bond. The rice bond is expressed in terms of rice and is used to pay for the purchase of paddy field. The sweet potato bond is expressed in terms of sweet potato and is used to pay for the purchase of dry land. Both kinds of bonds are redeemable in 20 semi-annual installments in 10 years at an interest rate of 4 percent per annum payable in kind.

The rice bond is further divided into 3 kinds redeemable entirely in commodity, or entirely in cash, or both in commodity and in cash according to the types of paddy field purchased. All the sweet potato bonds are redeemable entirely in in cash. These bonds are redeemed by converting the rice or sweet potato into cash according to the market price of the crops.

The rice and sweet potato bonds are issued in six different denominations. The rice bond denominations range from 50 kilograms to 10,000 kilograms and the sweet potato bond denominations from 100 kilograms to 30,000 kilograms. They were issued in the form of bearer bonds and on a decentralized basis in 22 administrative districts of the Province.

Of the total land purchase price on 1,272,855 metric tons of rice and 434,709 metric tons[1] of sweet potato to pay for the 143,000 chia of land transferred, 70 percent or 889,123 metric tons of rice bonds and 315,476 metric tons of sweet potato bonds were to be paid by the Government. The issuance of the bonds began in August 1953. In September the Government began to pay the principal and interest on the bonds issued. Up to June 30, 1954, 92% of rice bonds and 88% of sweet potato bonds had been issued, and 86% of the rice bonds and 84% of the sweet potato bonds maturing

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[1] Includes the compensation for immovable fixtures on land which are transferred together with the land.

and payable as the first and second installments have been paid by the Government.

2. *Issuance of Industrial Stocks.* To pay for the other 30% of the total land purchase price which amount to 383,732 metric tons of rice and 119,233 metric tons of sweet potato, the Chinese Government offered the following government enterprises for sale to the landlords: (a) The Formosa Agricultural and Forestry Development Corporation, (b) The Formosa Industrial and Mining Corporation, (c) The Formosa Paper and Pulp Manufacturing Corporation, and (d) The Formosa Cement Manufacturing Corporation. Of these four corporations, the first two were owned by the Provincial Government of Formosa and the other two were owned jointly by the National and Provincial Governments. The four corporations have a total capital of NT$970,000, according to the re-evaluation of their capital made by the Government in 1953. Of this amount, NT$790,-024,170 are government shares out of which NT$660,292,420[2] is to be paid in stocks for the 30% of the total land purchase price and out of which $517,780 is to be paid in cash to cover the fractional amounts less than one share.

The sale of these corporations was conducted by the Government in 1953 by transferring their stocks to the landlords on the following basis: The Paper and Pulp Manufacturing Corporation and the Cement Manufacturing Corporation were transferred in one single operation and the Agricultural and Forestry Corporation and the Industrial

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[2] The cash equivalent is obtained by converting the 30% payment in rice and sweet potatoes into monetary terms at NT$1.60 per kilogram of rice and NT$0.3885 per kilogram of sweet potato. The conversion rates represent the average market price of rice and sweet potatoes in December 1952 when the capital value of the four corporations was readjusted by the Government.

and Mining Corporation were transferred by units. The number of stocks which each corporation sold to pay for the 30% of the total land purchase price was allocated among the four corporations in proportion to their capital value. The ratio paid on the stock of the four corporations which each landlord was to receive for the 30% of the land price was as follows: (1) Agricultural and Forestry stock, 13%; (2) Industrial and Mining stock, 17%; (3) Paper and Pulp stock, 33%; and (4) Cement stock, 37%. On this basis the following amounts have been sold to the landlords: Agricultural and Forestry Development Corporation, NT$86,359,540; Industrial and Mining Corporation, NT$112,517,340; Paper and Pulp Manufacturing Corporation, NT$250,150; Cement Manufacturing Corporation, NT$243,647,610.

Any stocks which may remain in the hands of the Government after the 30% of the land purchase price has been paid off are to be used to pay a special group of landlords (those who are old, widowed, orphaned, infirm, or disabled) as additional compensation for lands purchased from them by the Government. If, after that, there should be still any further stocks remaining in the hands of the Government, they would be sold until nothing more is left.

The physical transfer of the stocks was preceded by the issuance of a kind of temporary certificates for the stocks before the latter were printed and ready. The issuance of these temporary certificates began on August 1, 1953. Up to June 30, 1954, 92% and 88% of the certificates to pay for the 30% of the purchase price of paddy field and dry land were issued respectively to the landlords under the program.

The formal issuance of stocks was begun on March 1, 1954 in exchange for the temporary certificates held by the landlords. As soon as all stocks are issued, stockholders meetings will be held to reorganize the four corporations into private enterprises.

Editor's Note: A subsequent article by the authors will round out the discussion of this problem aud bring the record of progress up to date.

Among articles soon to appear in
LAND ECONOMICS:

National Forest Contributions to Local Governments

By ELLIS T. WILLIAMS*

THE field of federal-state-local fiscal relations is receiving more attention at the present time than it has for many years past. An indication of the importance attached to this subject was the establishment in 1953, by Public Law 109 of the 83d Congress, of the Commission on Inter-governmental Relations (COIR). Among the subjects considered by the Commission is that of payments in lieu of taxes and shared revenues on account of real property in federal ownership—long a difficult problem in the area of public administration.

The federal Constitution, as construed by the courts, exempts federal property from taxation, except as Congress by statute may permit. As a matter of equity between federal and local taxpayers, however, Congress has from time to time provided for sharing of revenues, payments in lieu of taxes, or outright local taxation of federal property. The legal pattern is varied and complex. A recent report prepared by the Legislative Reference Service of the Library of Congress lists more than 50 provisions of law under which federal agencies are making "in lieu" payments of one kind or another to local governments.[1]

Among the many types of payment now in effect those relating to the national forests are of particular interest for several reasons. First, national forest contributions, originally established nearly 50 years ago, represent one of the oldest of such arrangements. Second, national forest payments apply to roughly 10 percent of the land area of the continental United States and are thus one of the most extensive of such plans. Third, national forest payments have increased over the years to more than $15 million annually; they represent one of the largest contributions in lieu of taxes turned over to the states and their political subdivisions by the federal government.

The national forests of the United States constitute a unique public resource. Situated in 39 states, they comprise some 160 million acres of timber and range land and uncounted mountain peaks, lakes, and streams. The location of these forests is shown on the accompanying map (figure 1). The national forests are managed in accordance with two basic principles: (1) sustained yield and (2) multiple use. Sustained yield means that the forests are managed for maximum continuous production of timber and other renewable resources. Multiple-use management looks to the coordinated development of all the resources and values of the land, whether timber, range, wildlife, recreation, or water.

Under Act of May 23, 1908, a payment amounting to 25 percent of gross receipts from each national forest is made at the end of the fiscal year to the state or territory in which the forest is located. These "25-percent fund payments" are then expended as the legislature may direct for the benefit of the public schools and public roads of the county or counties in which the national forest is situated. In addition, 10 percent of gross receipts is

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[1] *Federal Land Ownership and the Public Land Laws.* Report on taxes and other in-lieu payments on federal property, prepared by the Legislative Reference Service, Library of Congress, for the use of the Committee on Interior and Insular Affairs, House of Representatives. Committee Print No. 23. 83d Congress. 1954.
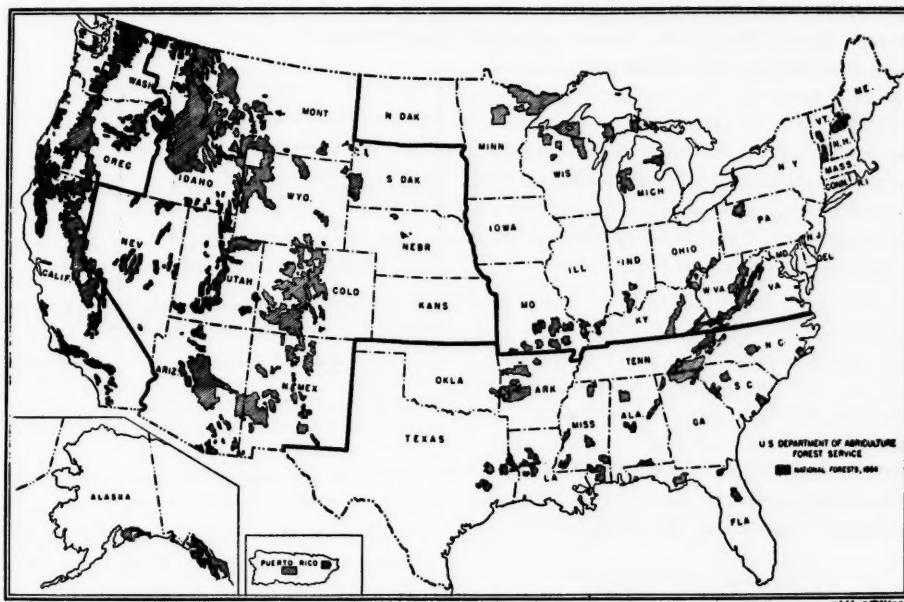
FIGURE I—MAP SHOWING NATIONAL FORESTS, 1954. HEAVY LINES INDICATE BOUNDARIES OF REGIONS TREATED IN THIS ARTICLE.

expended by the federal government for the construction and maintenance of roads and trails within the national forests.

From time to time the question has arisen in various parts of the country as to how the 25-percent fund payments compare to amounts that would be received by state and local governments from national forest lands if payments were equivalent to the taxes levied on similar property in private ownership. More than 15 years had passed since the question of national forest contributions had been studied in a comprehensive way;[2] therefore the Forest Service undertook such a study on a sampling basis for the year 1952.

This study was conducted with a threefold purpose: (1) to estimate amounts that might be payable on national forest

lands and timber if such amounts were equivalent to taxes on similar property in private ownership (such amounts are referred to in this article as "estimated taxes"), (2) to estimate the value of contributions in kind such as certain expenditures for roads and fire control that states or counties would be able and willing to spend in the absence of federal outlays, and (3) to compare estimated taxes with 25-percent fund payments and contributions in kind.

In addition to contributions in kind representing actual dollar outlays, important public benefits of a less measurable character, such as recreation and watershed values, result from national forest expenditures. These values, though important, cannot be expressed adequately in monetary terms and therefore were not specifically included.

Detailed studies were made for 135 sample counties from the 652 counties

[2] *National Forest Contributions to Local Governments.* Prepared by the Forest Taxation Inquiry, Forest Service, U. S. Dept. of Agriculture. 1937. Processed.

containing national forest lands. National forest lands in these counties comprise 40 percent of the total national forest acreage in the continental United States. In selecting sample counties, all national forest counties were grouped into 34 strata based on location and natural and economic characteristics. An average of 4 sample counties was then selected at random in each stratum.

The figures obtained for "estimated taxes" have sampling errors varying from 6.5 to 8.4 percent over the 4 major forest regions of the United States, and 5.7 percent for the country as a whole. The sampling error for each region and a description of the sampling method are presented in the section entitled "Statistical note" at the end of this article.

Summary of Findings

"Estimated taxes" on national forest land and timber resources in the calendar year 1952 were $29.7 million, or 19 cents per acre. Payments to local governments from the 25-percent fund totaled $17.4 million, or 11 cents per acre. Contributions in kind amounted to $38.8 million, or 24 cents per acre. Expressed in terms of percentage relationships, estimated taxes were 71 percent greater than 25-percent fund payments, but only 53 percent of 25-percent fund payments and specific contributions in kind together. These relationships are summarized below.

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                              Million   Cents
                              Dollars per acre Percent
Estimated taxes calendar year 1952..29.7....19
25% fund payments, fiscal year 1952..17.4....11
Contributions in kind, fiscal years
  1950-52, average annual.........38.8....24
Estimated taxes as percent of 25%
  fund payments...............................171
Estimated taxes as percent of com-
  bined 25% fund payments and
  contributions in kind...........................53
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Although estimated taxes exceeded 25-percent fund payments in 1952, this gap

was more than closed by contributions in kind (figure 2).
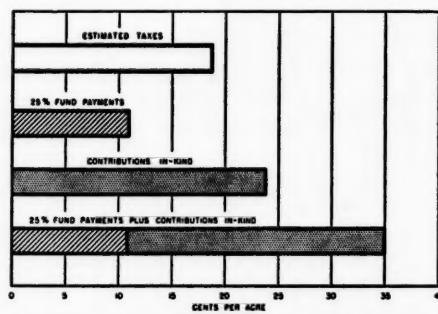
FIGURE 2—Estimated Taxes, Twenty-Five-Percent Fund Payments and Contributions in Kind, 1952.

Data for the major forest regions of the United States (figure 1), the Northern, Southern, Rocky Mountain, and Pacific Coast, are shown in Table I. The regional pattern is in accord with that for the country as a whole except in the South where estimated taxes were less than 25-percent fund payments.

It is of interest that over the past 15 years the tax per acre (based on data for farm real estate) has approximately doubled, while in the same period the 25-percent fund payments have increased more than tenfold. As the time approaches when full sustained yield capacity on the national forests will be realized, still further increases in 25-percent fund payments can be expected.

Estimated Taxes

Calculation of the estimated tax on national forest land and timber consisted of four steps: (1) Assessment officials were visited by local Forest Service personnel in each sample county to learn the assessment classes in local use and the average assessed values per acre for such classes. (2) The national forest area of the sample county was classified according to the assessment classes in local use, and the estimated assessed valuation

TABLE I—Comparison of Estimated Taxes, 25-percent Fund Payments, and Contributions in Kind by Regions

	Regions				Total
	Northern	Southern	Rocky Mountain	Pacific Coast	
National forest area (acres)...	12,622,280	9,433,907	95,144,024	42,577,908	159,778,119
Area of sample (acres)........	5,523,580	2,535,685	36,741,778	19,585,775	64,386,818
Sample as percent of total area	44	27	39	46	40
Estimated taxes, C. Y. 1952 (dollars).................	1,783,841	1,274,726	6,446,717	20,227,004	29,732,288
25% fund payments, F. Y. 1952 (dollars).............	752,546	2,620,485	3,052,611	10,966,603	17,392,245
Taxes as percent of 25% fund payments.................	237	49	211	184	171
Contributions in kind, average annual, F. Y. 1950-1952 (dollars).............	2,834,309	2,177,076	15,159,601	18,588,377	38,759,363
25% fund payments plus contributions in kind (dollars).	3,586,855	4,797,561	18,212,212	29,554,980	56,151,608
Taxes as percent of 25% fund payments plus contributions in kind.................	50	27	35	68	53
Estimated tax per acre (cents).	14.1	13.5	6.8	47.5	18.6
25% fund payments per acre (cents).................	6.0	27.8	3.2	25.8	10.9
Contributions in kind per acre (cents).................	22.5	23.1	15.9	43.7	24.3

was computed. (3) The local tax rate per $100 of assessed valuation was ascertained, and the total estimated tax and estimated tax per acre for the sample county were calculated. The average estimated tax per acre for the sample counties in each stratum was then multiplied by the national forest acreage in such stratum, to determine the estimated tax for the stratum. (4) Data for the various strata were added, to obtain regional figures.

Assessment Classes. Assessment has been called the heart of the general property tax since it determines how well or how poorly the burden of the tax in a given taxing district is to be distributed. As would be expected, wide variations in assessment classes and appraisal methods were found, not only from one state to another but also from county to county within a state. Moreover, in areas using the township or the town as the assessment district, variations were found within a given county.

In some areas all types of rural real estate were treated alike for assessment purposes, with no attempt at classification. In other areas a single class was used for all forest land irrespective of the volume or quality of the timber stand. Likewise, a single class for grazing or pasture land was often used. In still other cases, however, some distinction

was made between mature timber, young growth, and cut-over land, and in some of the more heavily timbered counties detailed classifications took into account such factors as timber species, volume, and accessibility. Similarly, a more or less detailed classification for range lands was sometimes found.

The quotations that follow are taken from field reports; though they are not representative of the country as a whole, they do indicate the conditions existing in certain areas. One report stated:

"The systems of classification and appraisal in the various counties follow no logical method . . . . They are standardized to the extent that in no county studied was the assessor able to explain how the appraisals are made. In many instances they are values which were assigned long ago and have remained in effect for years. In other cases, particularly true in the case of large owners, the valuations apparently are assigned by the owners themselves."

Another report was as follows:

". . . . there are no assessment classes or any classification whatsoever of timbered lands, or any type of land for that matter. In fact, there is no distinction made in the assessment records or no way to determine assessed valuation of land and improvements separately . . . . Valuation of timbered land as shown is not too uniform and has little or nothing to do with type of timber on it, and apparently accessibility and other similar factors are not considered. In fact the county clerk stated there were no guide lines or rules used, assessment is almost altogether based on previous year's assessments and seldom changed. He did state there was a tendency to assess nonresident higher than resident ownerships."

The passages cited doubtless give a somewhat one-sided impression of forest land assessments and omit reference to many counties where assessment practices are more nearly adequate and up-to-date. Nevertheless the picture that emerges does not inspire confidence that the existing tax burden on forest property is being equitably distributed. It confirms the widely held impression that much remains to be done in the improvement of forest land assessment practices.

Classification of National Forest Lands. In general, the classification of national forest lands into local assessment classes was accomplished without undue difficulty. In some counties, however, much of the timber is in federal ownership with relatively little in private ownership; as a result, timber assessment classes either had not been set up or were less detailed than would otherwise be the case. In such cases values were used that were as nearly as possible in accordance with existing assessment practices.

One classification problem in the Western States was the treatment of low-value areas not considered likely to pass into private hands if available for patent. These lands, consisting mainly of barren and subalpine areas, were classified as "unpatented" and no assessed values were assigned to them. Even if these lands had been given a nominal assessed valuation of 50 cents an acre, the estimated tax would have been increased only about 1 ½ percent in the regions containing lands of this character.

In addition to areas classified as "unpatented," further large areas merited a "waste," "wild," "non-producing" or similar classification carrying a very low valuation. This was to be expected since only 74 million acres of national forests lands out of a total of 160 million acres, or 46 percent, are regarded as "commercial" forest lands having substantial timber-producing value. A large portion of the national forests consists of rough mountain land having little commercial value but great public value for watershed, recreation, and other purposes.

Tax Rates. The next step was to ascertain the total 1952 tax rate per $100 of assessed value for each sample county

or subordinate assessment district. The tax rate used included state, county, town or township, school, road, and other local district taxes levied as part of the general property tax. In some cases district tax rates could simply be added together to obtain the total county tax rate, but in other cases it was necessary to use a weighted average rate or to assemble data by tax districts.

Tax rates varied widely from one district to another, as might be expected, since they reflect the local need for revenue and the assessment ratio in local use. The tax rate per $100 of assessed valuation in the sample counties fell typically within a range of $4 to $9, although rates of more than $19 per $100 were found in one area where low assessment ratios prevail.

In general, there appeared to be little difficulty in determining the appropriate tax rate to use. In one instance, however it was pointed out that a portion of the national forest area did not fall within any school district but was surrounded by a number of districts having varying tax rates. An average tax rate for the school districts in the county was used.

While it is probable that substitution of actual tax-equivalent payments in place of the present 25-percent fund payments and contributions in kind would lead to changes in the tax rate in certain counties, it was not practical to take this factor into consideration in the present study. In many counties such a change might well lead to some increase in tax rates, but in others the reverse would be true. To the extent that responsibility for maintenance of roads and other services on national forest lands was assumed by the states, revision of state tax levies might also be required.

Total Estimated Tax and the Estimated Tax Per Acre. The estimated tax on all national forest lands in the country was slightly under $30 million for the calendar year 1952, as shown in Table I. The Pacific Coast Region with an estimated tax of $20.2 million accounted for more than two-thirds of the total. The estimated tax in the remaining areas amounted to $6.4 million in the Rocky Mountain Region, $1.8 million in the Northern Region and to $1.3 million in the Southern Region. Expressed in terms of cents per acre, the estimated tax over the country as a whole was just under 19 cents. The estimated tax per acre was 47.5 cents in the Pacific Coast Region, 14.1 cents in the Northern Region, 13.5 cents in the Southern Region, and 6.8 cents per acre in the Rocky Mountain Region.

Twenty-Five-Percent-Fund Payment

National forest revenues are derived for the most part from sales of timber, this source having accounted for over 90 percent of gross receipts in the fiscal year 1952. Grazing fees made up 7 percent of the total, and the remainder consisted of fees for special land uses such as those for summer homes, resorts, and other recreational purposes, for telephone easements, mining uses, etc.

Twenty-five percent fund payments are shown by regions in Table I. These figures represent actual disbursements to local governments for the fiscal year 1952 and are not based upon sampling procedures. Payments for the country as a whole amounted to $17.4 million, including $45,000 paid to the state of Minnesota under an act of June 22, 1948. This act provided that 25-percent fund payments should not apply to certain wilderness portions of the Superior National Forest; instead, contributions in lieu of taxes consist of annual payments amounting to three-fourths of 1 percent of the fair appraised value of such lands.

Regional 25-percent fund payments ranged from a high of $11.0 million in

the Pacific Coast Region to roughly $750,000 in the Northern Region. Twenty-five-percent fund payments expressed in terms of cents per acre of national forest land, ranged from a high of 27.8 cents in the Southern Region to a low of 3.2 cents in the Rocky Mountain Region. For the United States as a whole the average payment was 10.9 cents per acre, or 59 percent of the estimated tax of 18.6 cents per acre.

To show the recent trend, 25-percent fund payments for each fiscal year, 1938-52 inclusive, are listed in Table II. Total 25-percent fund payments have grown steadily from $1.1 million in 1938 to $17.4 million in 1952. In terms of cents per acre, the increase has been from 0.7 cent at the beginning of the period to just under 11 cents 14 years later. Expressed in dollars of constant (1938) purchasing power, the increase over the period has been from 0.7 cent per acre to 4.9 cents per acre.

TABLE II—TOTAL 25-PERCENT FUND PAYMENTS, FISCAL YEARS 1938-52 INCLUSIVE

Fiscal Year	Total Payments	Total Payments Per Acre
1938...........	$ 1,134,265	0.7c
1939...........	1,190,994	0.8
1940...........	1,428,083	0.9
1941...........	1,571,354	1.0
1942...........	1,765,072	1.1
1943...........	2,479,863	1.6
1944...........	3,844,122	2.4
1945...........	3,971,614	2.5
1946...........	3,424,914	2.2
1947...........	4,546,977	2.9
1948...........	5,968,305	3.8
1949...........	7,710,888	4.8
1950...........	8,353,595	5.2
1951...........	13,966,115	8.7
1952...........	17,347,239[1]	10.8

[1] Differs from total shown in Table I, which includes payment to State of Minnesota under act of June 22, 1948.

Twenty-five-percent fund payments for individual states naturally show wide variations. In 1952 payments were in excess of 25 cents per acre in 8 states. These states are listed in Table III, with 1938 payments shown for purposes of comparison.

TABLE III—25-PERCENT FUND PAYMENTS PER ACRE FOR SELECTED STATES FISCAL YEARS 1952 AND 1938

	1952 Cents	1938 Cents
Texas...........................	77.6	0.7
Mississippi.....................	41.3	0.7
South Carolina..................	40.8	1.6
Oklahoma......................	34.6	2.8
Oregon........................	33.5	0.9
Alabama.......................	32.2	0.3
Louisiana......................	27.7	1.1
Washington....................	26.7	1.1

Regional and state averages may hide a substantial spread in 25-percent fund payments to individual counties. In 1952 roughly half the 652 counties containing national forest lands received up to 6 cents per acre, a quarter of the counties received from 7 to 18 cents per acre, and the remainder received amounts ranging from 19 cents to $1.48 per acre.

Contributions in Kind

Contributions in kind for which the national forest system was given credit in the study were limited to those federal expenditures that could reasonably be expected to have been made by state, county, or other local governments in the absence of national forest expenditures. Judgment is necessarily involved in estimates of this kind; nevertheless, an attempt was made to apply uniform criteria in the various regions. National forest expenditures were not included merely because they served a useful purpose or had some public benefit. The test applied was whether the particular expenditures were such that the state or local government would actually have been financially able and willing to spend equivalent funds during the period in question if national forest expenditures had not been made. The specific con-

tributions included in the study represent three types of expenditure—(1) for fire control, (2) for the construction and maintenance of roads, trails, and structures, and (3) for Forest Highways.

Contributions in kind, summarized by region in Table I, are estimated to have averaged $38.8 million annually for the country as a whole during the period 1950-52. Contributions ranged from $18.6 million in the Pacific Coast Region to $2.2 million in the Southern Region. On a per acre basis the nation-wide average of contributions in kind was 24.3 cents, with a range from 43.7 cents in the Pacific Coast Region down to 15.9 cents the Rocky Mountain Region. Only in the Pacific Coast Region were contributions in kind less than the estimated tax.

Fire Control. Annual expenditures per acre currently being made by the respective states on private lands were judged to serve as a better guide in most cases than actual national forest fire control expenditures. The estimated fire control contribution for the country as a whole amounted to $11.7 million or an average of 7.3 cents per acre of national forest land annually, as shown in Table IV.

TABLE IV—Estimated Contributions in Kind, in Cents per Acre By Region, Average Annual, Fiscal Years 1950-1952 Inclusive

Regions	Fire Control	Road and Trail and other	Forest Highways	Total Contributions in kind
Northern........	6.4c	6.1c	10.0c	22.5c
Southern........	4.8	8.0	10.3	23.1
Rocky Mountain.	2.2	3.4	10.3	15.9
Pacific Coast.....	19.3	8.8	15.6	43.7
All regions.......	7.3	5.3	11.7	24.3

Fire control contributions ranged from a high of 19.3 cents per acre in the Pacific Coast Region to a low of 2.2 cents in the Rocky Mountain Region. Over the country as a whole the fire control contribution credited was roughly 70 percent

of actual average direct expenditures for fire control on the national forests during the years in question.

Roads, Trails, and Structures. Roads, trails, and structures provided the greatest scope for individual judgment. For roads, a useful test for inclusion was that of mail or school bus use, since state or local authorities can be expected to build or take responsibility for maintaining roads used in this way. National forest property service roads were excluded unless it seemed likely that public construction or maintenance by local authorities would be required in the absence of Forest Service expenditures for this purpose. Only the recreation, wildlife, or other public facilities that clearly would receive state or local funds were included. Administrative sites, radio stations, telephone lines, and other Forest Service facilities were excluded.

Contributions for roads, trails, and structures are estimated to have averaged $8.4 million annually during 1950-52 or, as indicated in the tabulation above, 5.3 cents per acre for the country as a whole. This amounted to roughly 45 percent of total direct national forest expenditures for such purposes during the period. The Pacific Coast showed the highest contribution, 8.8 cents per acre, and the Rocky Mountain Region the lowest, 3.4 cents per acre.

Contributions of this type varied considerably from one area to another. For example, one field report stated that roads that serve local residents had been included or, in the case of protection roads, those which lead from one settled community to another and receive fairly heavy travel between such communities. Also included were certain trails leading into heavily used hunting and fishing areas and developed camp grounds, and three back-country landing fields used

enough by hunters and fishermen to require upkeep at public expense.

In another area multi-purpose roads used for camping and picnicking, hunting and fishing, mining, public travel, special use, or winter sports were included, although dead-end spurs leading off from such roads were often excluded. Roads used exclusively for national forest administration, fire protection, research, or timber sales, were excluded. Trails were included when it was believed that they would be acquired and maintained by State Fish and Game Commissions, county recreation boards, etc. Expenditures for forest insect and disease control were generally included, but not those for other timber management operations. Included also were certain expenditures for wildlife improvements, watershed rehabilitation, and recreational improvements. Range-management improvements were excluded.

Still another report stated that the road and bridge expenditures given credit related mostly to facilities that had been taken over by the counties and have become parts of their road systems. No trails were included. Expenditures for recreation and wildlife developments and certain flood-channel improvements were included.

In another area each county is required by law to designate primary and local roads of sufficient public value to justify state or county maintenance. This classification was used in determining road expenditures considered as contributions in kind. Maintenance of recreational facilities open to the general public, such as camping and picnicking areas and winter sports areas, were also included.

Forest Highway. Under the Federal Highway Act of 1921, as amended, the federal government provides funds for the construction and maintenance of Forest Highways of primary importance to the states, counties, or communities within, adjoining, or adjacent to the national forests. These funds are independent of the federal aid highway program in general and accrue to the states only by reason of the existence of the national forest system.

Forest Highway expenditures as reported by field offices averaged $18.7 million annually over the period 1950-52, or 11.7 cents per acre of national forest land. As shown in the foregoing tabulation, Forest Highway expenditures ranged from 15.6 cents per acre on the Pacific Coast to 10.0 cents in the Northern Region. Figures issued by the Bureau of Public Roads for the years in question exceed those claimed as contributions. For the country as a whole, they indicate average expenditures for survey, construction, engineering, and maintenance of Forest Highways to be 12.4 cents per acre of national forest land.

Comparison of Estimated Taxes, Twenty-Five-Percent Fund Payments, and Contributions in Kind

For the United States as a whole, as shown in Table I, the estimated tax was 71 percent greater than the 25-percent fund payments from gross receipts. Only in the Southern Region were estimated taxes less than 25-percent fund payments —reflecting a combination of high national forest productivity and relatively low tax rates.

The sum of 25-percent fund payments and contributions in kind was $56.2 million. For the country as a whole, estimated taxes amounted to only 53 percent of total contributions. The Southern Region had the lowest ratio of estimated taxes to contributions (27 percent) and the Pacific Coast the highest (68 percent). Expressed as cents per acre of national forest land, total contributions

of 35.2 cents (25-percent fund contributions of 10.9 cents plus contributions in in kind of 24.3 cents) were almost twice as much as the estimated taxes of 18.6 cents per acre.

Other Benefits

In addition to the revenue-sharing payments and contributions in kind already described, many other benefits accrue to local communities from the national forests. Among these benefits are watershed values, recreational values, and the maintenance of local economies that results from stability of forest management. Although the importance of other benefits in all regions was fully recognized, it was not practical to evaluate such benefits in monetary terms.

Sustained good management of watershed lands is of increasing importance throughout the country. In the arid West, for example, the national forests are the source of approximately 60 percent of the total water supply. Billions of dollars invested in irrigated agriculture and water-power development are represented by industries that are dependent upon a continuing delivery of usable water. Large public and private investments have also been required to assure an adequate domestic water supply. The local tax base in turn is dependent upon this industrial and residential development. Good watershed management is needed in the East also where national forest acquisitions under the Weeks law of 1911 have in part been designed to regulate the flow of navigable streams.

The right of free access to public lands for recreational purposes is an asset of inestimable worth to both the local and the national community. In 1952 there were more than 33 million visits to the national forests for camping, picnicking, winter sports, hunting, fishing, and enjoyment of scenery. The total number of sportsmen alone was 6.3 million, of whom 2.3 million were hunters and 4 million were fishermen. Substantial revenues are realized annually by packing and guide outfits, resort operators, and equipment and supply dealers. Although much of the recreational use of the national forests is in the West, other parts of the country also benefit. In the East as in the West, wide areas of national forest lands are within easy reach of large metropolitan centers.

The benefits that accrue to forest industry through the availability of assured permanent sources of raw material have increased markedly over the years and are still growing. National forest protection and management are designed to provide local wood-using industries with continuing yields of timber and other forest products. In many forest areas the restoration of depleted lands, timber management, and regulation of the cut on the national forests are important factors in stabilizing local forest industries and general business.

A comparison of estimated taxes on national forest lands with 25-percent fund payments alone, or even with the sum of such payments and contributions in kind for fire control, roads, trails, and Forest Highways, clearly fails to show the real situation. The total national forest contribution includes all three types of benefit that have been described: (1) cash payments from gross receipts, (2) contributions in kind, and (3) the wide variety of other forest values.

Statistical Note

The sampling method used in this study is known as "sampling from within strata with probabilities proportional to size of unit."[3]

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[3] Frank Yates, *Sampling Methods for Censuses and Surveys* (New York: Hafner Publishing Co., 1949), Sections 3.10, 6.17, and 7.16.

Within each Forest Service administrative region several strata were delineated to improve the distribution of sample counties. Within each of these strata, sample counties were selected at random with probabilities of selection proportional to the area of national forest land in each county. Thus a county with twice as much national forest area as another county had twice the probability of being selected.

Analysis of sampling accuracy was limited to regions and to the country as a whole. The sampling error, taken as one standard error, was as follows:

Region	Percent
Northern	6.5
Southern	8.4
Rocky Mountain	6.7
Pacific Coast	7.9
All Regions	5.7

In addition to errors that result from sampling rather than making a complete canvass, non-sampling errors also occur. These may include mistakes in judgment, classification, and recording. Non-sampling errors were minimized through the preparation of guiding instructions and uniform criteria, field training sessions, regional supervision, and statistical check of compilations.

The Measurement of the Economic Base of the Metropolitan Area

By JOHN M. MATTILA *and* WILBUR R. THOMPSON[*]

THE current revival of interest in regional economic research has been quietly undergoing a subtle shift in areal orientation. Increasingly, emphasis has been diverted from the traditional national regional survey (*e.g.* the "mature New England economy," the "underdeveloped South," etc.) toward the spatially narrower, more intensive, *metropolitan area economic base study.*[1] The attractiveness of the "metropolitan area" as *the* appropriate unit of regional economic analysis stems primarily from the current rush of "regional economists" to recognize explicitly, albeit somewhat belatedly, differences in degree of spatial mobility between the various factors of production. The rapidity and easy accord with which the profession has practically unanimously characterized capital as possessing a much higher degree of interregional (as well as international) mobility than is characteristic of labor is so impressive and unusual as to be breath-taking. Even though one might do well to distinguish between railroad freight cars and railroad rails on the one hand and apartment-dwelling bachelors and home-owning heads of families on the other hand, if this may be sloughed off for the present as quibbling, a distinctly new and highly intriguing areal focus has been brought to bear on the long-neglected field of regional economics.

The substantive effect on regional economic analysis of emphasis on the spatial immobility of labor has been neatly and succinctly formulated by John V. Van Sickle in a recent observation.[2]

"Nonetheless, interregional labor movements are so sluggish compared to interregional capital movements that we are justified in basing our concept of economic regions on labor market areas.

"What Is a Region? A region, from a strictly economic point of view is a consolidated area within which the resources (human, natural, and artificial) on which the population must depend—in the absence of outside aid—result in a pattern of factoral rewards which sets it off from adjacent areas. The persistence of a pattern is due, of course, to the fact that labor and entrepreneurship are not completely and perfectly mobile. . . . (The few, large) . . . . conventional regions of the United States are really expressions of historical, cultural, and sociological factors rather than strictly economic factors."

Thus, while the product market area of local industries may vary from a small fraction of the encompassing metropolitan area (*e..g.,* various neighborhood retail trade and service activities) to the total national or even world economy (*e.g.,* automobile and steel manufacturing), the labor market for most local industries is conceived as being roughly coincident with the metropolitan area. Accordingly, while human migration is

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[1] The "metropolitan area" in mind and statistically employed throughout this study is the Census-defined "standard metropolitan area," generally composed of "a county or group of contiguous counties which contains at least one city of 50,000 inhabitants or more." Cf., Bureau of the Census, *U. S. Census of Population: 1950, Vol. 1, Number of Inhabitants,* ch. 1 (U. S. Summary. Washington, D. C., U. S. Government Printing Office, 1952), p. xxxi.

[2] John V. Van Sickle, "Regional Economic Adjustments: The Role of Geographical Wage Differentials," *Papers and Proceedings Sixty-sixth Annual Meeting of the American Economic Association*—December 28-30, 1953, May 1954, pp. 382-3. In contrast to Van Sickle, Seymour Harris is inclined to bracket "management" with capital with reference to spatial mobility, regarding them both as highly mobile intranationally. Seymour E. Harris, "Interregional Competition: With Particular Reference to North-South Competition," *ibid.,* p. 368.

entrusted to effect a secular tendency toward interarea income equalization, the spatial immobility of labor temporarily isolates the labor supply of the metropolitan area from the rest of the economy and closely identifies their economic welfare with the general prosperity of the metropolitan area within which they reside. Thus, the spatial immobility of labor provides the regional economist with a natural *spatial short run* which, for analytical purposes, is analogous to the classical economist's *functional short run* founded on the parallel functional immobility of capital. Carrying the analogy a step farther, the "metropolitan area" assumes a structural role comparable to the "industry" of partial equilibrium-analysis fame.

Having selected the metropolitan area as the appropriate area of regional analysis, the common procedure is for the regional analyst to proceed directly to the task of identifying and segregating the area's economic base and, residually, the economic superstructure. Even as the welfare of the local labor force is tied to the prosperity of the metropolitan area, the metropolitan area's prosperity itself is tied to the vitality of a limited number of "basic "economic activities in which it has specialized. "Basic" activities are the areas' "breadwinners" in that they provide the export surplus which generates the net income stream upon which the economic wellbeing of the area's inhabitants is founded. Therefore, a fruitful investigation of the volume, level, stability and/or distribution of the income and employment of any regional area must perforce begin with the process of identifying and weighting (ranking) the area's basic (export) activities.

The current flood of *metropolitan area economic base studies* provides eloquent testimony on behalf of the theoretical attractiveness, empirical adaptability, and public policy relevance of the metropolitan area as the focal point of regional research.[3] The sole cause for any reservations concerning this current burst of regional research activity is the "clear and present danger" that only the most tentative, path-breaking, theoretical sorties have been launched into problems of methodology and measurement so as to ensure the harvesting of reasonably digestible fruits of research. At this point one must echo the remarks of a contemporary observer that, with the exception of a few chance theoretical insights, the urban base studies to date have been performed highly mechanically with undiscriminating recourse to the crudest tools of analysis in such a manner so as to be excused only by the relentless demands of the large scale pragmatic projects of which they were usually but a part.[4]

The purpose of this study is not nearly so ambitious as to attempt a *tour de force* of economic base identification and measurement techniques. Such legitimate avenues of investigation as individual firm and industry studies, questionnaire methods, and regional balance of payments analyses will be by-passed in order to concentrate on the much more limited and modest objective of reviewing various "aggregative" base identification techniques currently being employed by regional analysts. The *aggregate-comparative-inferential* methods of the day, lightly dubbed "macrocosmic" methods by Andrews, essential rely on inferences drawn from a comparison of national and local patterns of economic activity.

Further, two simplifying steps will be taken of which the reader should be made

[3] For an up-to-date bibliography of urban economic base studies see the list compiled by Katherine McNamara, Librarian, Department of City Planning and Architecture, Harvard University, reprinted in *Land Economics*, May 1954, pp. 186-91.

[4] Richard B, Andrews, "Mechanics of the Urban Economic Base: General Problems of Base Identification," *Land Economics*, May 1954, pp. 171-72.

aware. First, the "nation" will be considered as the framework of reference (and as such a "closed" economy), thereby ignoring the role of international trade. Second, a simple dichotomy of product market orientation of local industry has been constructed such that local products are either "exported" or locally consumed. No distinctions will be drawn between national and regional export markets of local industry, *e.g.*, the national automobile market versus the southeastern Michigan regional wholesale trade market of Detroit. The effect of such a simple dichotomy is to understate a locality's export activity. Finally, a careful consideration of the numerous subtleties inherent in the choice of the data selected to represent economic activity will also be shrugged-off as outside of the scope of this study.[5] Thus, employment data has been selected not because it is ideally suited to the problem at hand but, rather, because the data is easily available in a form suitable for use in illustrating the general "macrocosmic" statistical techniques currently being applied to various types of economic data.

I. An Index of Local Specialization

A. Unadjusted Form. The index most commonly used to identify the urban economic base is a simple ratio of an industry's share of local employment relative to the industry's share of national employment or, alternatively, a locality's share of industry employment relative to the locality's share of national employment as shows below:[6]

$$\frac{e_i}{e_t} \quad \text{or} \quad \frac{e_i}{E_i}$$

$$\frac{E_i}{E_t} \qquad \frac{e_t}{E_t}$$

where: e_i local industry employment
e_t local total employment
E_i national industry employment
E_t national total employment

In essence, this index indicates the importance of the industry to the locality *relative* to the importance of the industry to the nation.

The above index is commonly employed as an indicator of the product market orientation of a local industry (i.e. "basic" or "local service"), but, as will be highlighted below, this index must be interpreted with caution as a measure of the degree to which "basicness" is exhibited. The usual inference is that, when the value of the index is one, local production per capita is equal to the national production per capita and, therefore, local production is just sufficient to satisfy local consumption (demand) and the locality neither exports nor imports the good or service in question. Similarly, an index value greater than one presumably indicates that the locality has "extra" workers, produces a "surplus" of the good or service, and "exports" this surplus.

To infer local specialization and exportation from an index value greater than one requires a special combination of inter-related assumptions. Specifically, a coefficient of greater than one

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[5] However, in passing, it might be mentioned that the best theoretical alternatives to employment as indices of economic activity are empirically impracticable. Data on income generated, classified by industrial origin, is unattainable at less than the state level of areal subdivision. *Firm value added* data is available on a local basis but it generally measures the productive contribution of local labor and "foreign" capital, whereas, what is needed is a measure of *local value added, i.e.*, the productive contribution of local labor and local capital, if any. Value of product data is useless for most economic research. The distortion created by equating local economic well-being to local employment (or even wage income) data rather than to a more sophisticated measure of economic well being such as *local disposable income* may well be questionable procedure in the economic analysis of small resort towns or "retirement communities." However, the use of employment data does not pose as serious a problem in the study of the large metropolitan area, where more refined techniques add so little to accuracy that the additional cost in time and money is usually unjustified.

[6] This index was first devised as a "location quotient" by P. Sargent Florence. Cf. Political and Economic Planning, *Report on the Location of Industry* (London: March 1939), p. 287; also, National Resources Planning Board, *Industrial Location and National Resources* (Washington: 1943), Ch. 5, p. 107.

indicates *per se* only that the locality's *labor force* is more heavily "specialized" in (allocated to) the industry in question than is true of the nation on the average. If average or greater productivity per worker is assumed for this locality, we may conclude that the locality's *production* is more heavily "specialized" in this good or service than is true of the nation on the average. The logical transition from local productive specialization to local exportation of this "surplus" production requires that the above assumption be supplemented by the further assumption that the locality's consumption per capita is equal to that of the nation on the average. Of course, the locality's per capita consumption of a good or service may deviate from the national average because of one or all of the following factors: local differences in taste patterns, income levels, or relative price patterns.[7]

In addition to the above, exceptional cases of local export industries are easily conceivable which exhibit coefficients of less than one due to high productivity per worker, or low consumption per capita relative to the national average. An instance of the latter case would be a *large tropical city* within commuting distance of a *small coal mine*. The general import of the preceding discussion is that,

strictly interpreted, the *index of local specialization* is really a measure of labor force specialization *per se*, and only by successively more tenuous inferences may it be extended to the role of an index of product specialization and, ultimately, product-market orientation of local industry.

B. The Adjusted Form. A modified form of the *index of local specialization* deserves our attention at this juncture. The national ("benchmark") quantities are adjusted by subtracting the local economy from the national economy to eliminate the "overlap".[8] A later rationalization offered for this adjustment

$$\frac{\dfrac{e_i}{e_t}}{\dfrac{E_i - e_i}{E_t - e_t}}$$

was that "the subtraction was necessary to prevent a downward bias in the resulting quotients, particularly for specialized industries."[9] It will be noted that, when the unadjusted index is equal to one, the adjusted index will also equal one because the numerator and the denominator of the denominator of the index are each proportionately reduced. If the unadjusted index is greater than one, the adjusted index will be the larger because the numerator of the denominator will be reduced more (proportionately) than the denominator of the denominator of the index. Similarly, if the unadjusted index is less than one, the adjusted index will be the smaller. Thus, the effect of the adjustment is to spread out the values of the index about a value of one

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[7] Surely, one could find numerous cases of industries for which the *index of local specialization* exhibits values of substantially greater or less than one when exportation or importation of the good or service seems, at least on the basis of *prima facie* evidence, a less reasonable inference than local variations in consumption per capita. For example, using Census classifications and 1950 Census data, an index value of 1.91 for "bowling alleys" of the Detroit Standard Metropolitan Area could probably be most easily "explained" by recourse to taste pattern peculiarities of the area. Similarly, an index value of 1.74 for "fuel and ice" of the Boston Standard Metropolitan Area as against a value of 0.30 for the San Francisco Standard Metropolitan Area also appears to be largely taste pattern phenomena (via climatic conditions). Again, "domestic service in private households," as a personal service industry, exhibits an index value of 1.48 for the Baltimore Standard Metropolitan Area, reflecting, at least partially, the much lower wage rates for domestic help in Baltimore than in the nation on the average (*i.e.*, local differences in relative price patterns).

[8] George H. Hildebrand and Arthur Mace, Jr., "Employment Multiplier in an Expanding Industrial Market," *Review of Economics and Statistics*, August 1950, p. 245.

[9] Chester Rapkin, Louis Winnick and David Blank, *Housing Market Analysis, A Study of Theory and Methods*, (Washington, D. C.: Housing and Home Finance Agency, December 1953), p. 50.

without changing the rank order. In essence, the adjustment eliminates the "averaging out" effect of including the locality in the benchmark economy. In light of the fact that the rank order of the indices remains unchanged, the usefulness of undertaking such a time-consuming adjustment seems dubious.

Further, and much more fundamental, the unadjusted *index of local specialization* has the added attraction of not only ranking industries according to degree of local specialization but, in addition, the unadjusted index serves as an indirect measure of "surplus" workers relative to total local industry employment. To demonstrate this characteristic, let us consider the simple hypothetical example set forth below. Assume that e_i equals 12, e_t equals 120, E_i equals 30 and E_t equals 1,200 then the values of the unadjusted and adjusted index are as follows:

<div align="center">

*Unadjusted Index
of Local Specialization*

$$\frac{\dfrac{e_i}{e_t}}{\dfrac{E_i}{E_t}} = \frac{\dfrac{12}{120}}{\dfrac{30}{1,200}} = 4$$

*Adjusted Index of
Local Specialization*

$$\frac{\dfrac{e_i}{e_t}}{\dfrac{E_i - e_i}{E_t - e_t}} = \frac{\dfrac{12}{120}}{\dfrac{30 - 12}{1,200 - 120}} = 6$$

</div>

The value of 4 for the unadjusted index indicates that the locality is 4 times as specialized in the industry as is the nation as a whole and by inference (employing the necessary assumptions outlined above) has 4 times as many workers as are needed for the locality's own con-

sumption of this good or service. Or, to rephrase, one-quarter of the locality's industry employment (3 workers) is required to satisfy domestic needs and the remaining three-quarters (9 workers) are "surplus" workers presumably producing for "export." This conclusion is confirmed by pro-rating to this locality a fraction of the total industry employment equal to its fraction (10%) of the labor force (population) or 3 workers. The remaining 9 workers in this locality may be identified as "surplus" or, more inferentially, "export" workers.

Conversely, the adjusted *index of local specialization* exhibits a value of 6 and thereby overstates the multiple by which the local industry employment exceeds its pro-rata share. This is so because in the case of industries in which the locality has a greater than average specialization the use of the *remainder* of the economy as a base for determining the locality's pro-rata share of the industry understates the relative importance of the industry in the total economy (i.e. national consumption) and, by extension, understates the number of workers necessary to satisfy local requirements. In effect, the adjusted index measures the divergence between the locality and the outside world and becomes accordingly a measure of local *uniqueness*. For most purposes, an index that measures local *uniqueness* would seem to be less useful than an index which measures local specialization and, simultaneously, indirectly reflects the relative proportion of domestic and "surplus" workers.

II. An Index of Surplus Workers

A. Absolute Form. Rather than relying on an index which only *implicitly* and *indirectly* measures "surplus" workers, an index may be constructed which *explicitly* and *directly* measures the absolute number of "surplus" workers by calcu-

lating the difference between actual local industry employment and the locality's pro-rata share of national industry employment as shown below:[10]

$$S = \frac{e_i - e_t}{E_t} E_i,$$ where S represents the absolute number of "surplus" workers in the industry "i"

The upper limit of this latter index approaches e_i asymptotically as the size of the locality under consideration becomes infinitely small relative to the benchmark economy

$$(i.e. \text{ as } \frac{e_t}{E_t} \text{ approaches zero}).$$

This is equivalent to saying that the number of "surplus" workers in any local industry could never exceed or even equal that industry's total local employment. In passing, it may be noted that e_i itself, is limited by the value of E_i, or to phrase this more descriptively, the piccolo industry *potentially* could never play as basic a role in a given locality as the automobile industry. The lower limit of this index is e_t

$$-\frac{e_t}{E_t} E_i,$$

i.e. the "deficit" of local industry workers could never exceed the locality's pro-rata share of the national industry employment (assuming local per capita consumption equal to the national average), and even this value would be attained only if there were absolutely no local employment in the industry in question. These limits may be summarized as follows:

$$-\frac{e_t}{E_t} E_i \leq \left[e_i - \frac{e_t}{E_t} E_i \right] < e_i \leq E_i$$

[10] An index based on the absolute number of "surplus" workers seems to have been constructed first by Homer Hoyt in a monograph prepared for the Regional Plan Association of New York, *Economic Status of the New York Metropolitan Region in 1944* (New York: 1944).

The distinction between the *index of local specialization* and the *index of surplus workers* as measures of the "basicness" of an industry in a locality's industrial structure is best demonstrated by recourse to the simply hypothetical example below.

City "A"		"Nation"	
e_i	20	E_i	50
e_j	40	E_j	200
e_t	100	E_t	1000

	Industry "i"	Industry "j"
Index of Local Specialization	$\dfrac{\frac{e_i}{e_t}}{\frac{E_i}{E_t}} = 4.0$	$\dfrac{\frac{e_j}{e_t}}{\frac{E_j}{E_t}} = 2.0$
Index of Surplus Workers	$e_i - \frac{e_t}{E_t} E_i = 15$	$e_j - \frac{e_t}{E_t} E_j = 20$

In the example above, even though City "A" appears to be more "specialized" in industry "i," industry "j" contributes a greater number of "surplus" workers to (*i.e.* accounts for a larger part of) its economic base. This is so because the larger size (locally) of industry "j" more than offsets industry "i" 's higher proportion of export activity to total activity. However, it will be noted that although industry "j" is twice as large as industry "i" locally, the former has less than twice as many "surplus" workers as the latter because industry "j" is four times as large as industry "i" nationally and, therefore, a greater *percentage* of industry "j" 's workers are locally "required" workers.

Now two distinct interpretations of the term "basicness" become apparent. Industry "i," with the greater *proportion* of "surplus" workers, exhibits the greater degree of "industry basicness," *i.e.* the degree to which the industry itself is a "basic" (export) industry. Industry "j," with the greater *number* of "surplus" workers, exhibits the greater degree of "local basicness," *i.e.* the degree to which

the industry is "basic" (vital) to its locality.

In essence, the primary distinction between the *index of local specialization* and the *index of surplus workers* is the dissimilarity of their respective weighting systems. The *index of local specialization* automatically accords to each local industry an equal weight, thereby implicitly assuming all local industries are equally "important" (*i.e.*, afford equal employment opportunities) to the community.[11] Contrarily, the *index of surplus workers* automatically accords to each local industry a weight in direct proportion to its size (local employment). Since, almost without exception, in recent writing on the subject of the urban economic base, the concept of "basicness" of a local industry is treated as synonymous with capacity to generate net additions to local income from "foreign" sales, the relative size of local industries is clearly relevant. Since an absolute measure of the number of surplus workers automatically reflects relative industry size, the *index of surplus workers* is a better measure of the net income generating capacity of a local industry and, therefore, it would seem that this index exhibits a clear advantage over the *index of local specialization* as a measure of the "basicness" *of an industry to its locality.* In that it is this latter concept of "basicness" that is usually at issue in the typical urban base study, investigators would do well to place primary reliance on the *index of surplus workers.*

B. Relative Form. A further distinction between the two indices, in the form considered above, is that the *index of local specialization* is expressed in terms of relatives and therefore is equally applicable to either inter- or intra-city industry comparisons, whereas, the above *index of surplus workers* is expressed in terms of absolutes and, therefore, is only appropriate for intra-city industry comparisons.[12] Fortunately, the *index of surplus workers* can be converted easily into a relative form for inter-city industry comparisons, where reference to relative size of city is desirable, by dividing the index either by total local employment or by total local surplus workers as shown below:[13]

$$\frac{e_i - \frac{e_t}{E_t} E_i}{e_t} \qquad \qquad \frac{e_i - \frac{e_t}{E_t} E_i}{\sum \left[\overline{e_i - \frac{e_t}{E_t} E_i} \right]}$$

The relative forms of the *index of surplus workers* shown above produce indentical rank orders of industries not only within cities but also between cities if the cities in question are equally self-sufficient, *i.e.*, "surplus" workers as a percent of total local employment is the same for all

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[11] True, it is possible to modify the *index of local specialization* by explicitly introducing alternate weighting systems. For example, local-employment weighting may be accomplished by multiplying the index by local industry employment as a percent of local total employment (e_i/e_t). However, this procedure is encumbered by the necessity of first identifying the export industries before applying the weighting system, otherwise, large non-export industries (*i.e.*, local service industries which have unweighted indices of 1.0 or less but which account for a large share of local employment generally) may attain values (products) which exceed smaller export industries.

[12] The *index of local specialization* may be used in interregional comparisons of a given industry, *e.g.*, automobile manufacturing in Detroit versus Flint. However, since this index implicitly weights all industries equally, it is inappropriate for interregional comparisons of different industries, *e.g.*, automobile manufacturing in Detroit versus steelmaking in Pittsburgh.

[13] The close relationship between the *index of local specialization* and the *index of surplus workers* is particularly striking when the latter is expressed in the relative form using total local employment as the common denominator.

$$\frac{e_i - \frac{e_t}{E_t} E_i}{e_t} = \frac{e_i}{e_t} - \frac{E_i}{E_t} \; ; \; \text{compare to:} \qquad \frac{\frac{e_i}{e_t}}{\frac{E_i}{E_t}}$$

Or, in simple descriptive terms, the distinction between the *index of surplus workers*, expressed in the relative form above, and the *index of local specialization* is that the former measures the *difference* between local and national degree of specialization and the latter measures the *ratio* of local to national degree of specialization.

the cities compared. However, in that there is no *a priori* reason for believing that all cities are equally self-sufficient and empirical evidence introduced below substantiates this doubt, the question is posed as to which of these two forms more accurately measures the "basicness" of an industry to its locality. Using the simple hypothetical data below, let us raise this fundamental question: Is industry "i" in city "A" or industry "j" in city "B" more "basic" to its respective locality?

	City "A"	City "B"
"Surplus" workers in industry "i"	20	
"Surplus" workers in industry "j"		15
Total "surplus" workers	40	20
Total employment	100	100

Applying the two relative forms of the *index of surplus workers* to the above example, diametrically opposite results are obtained. The total-employment form shows an index value of 20 (or .20) for industry "i" which exceeds the corresponding index value of 15 for industry "j," whereas, the total-surplus-worker form shows an index value of 50 for industry "i" which is exceeded by the corresponding index value of 75 for industry "j."

To place this seeming paradox in more revealing perspective, consider the impact of a sudden disappearance or complete collapse of these two industries on their respective localities. Would city "A," which would lose a larger fraction of its total employment (20% to 15%), fare better or worse than city "B," which would lose a larger fraction of its export employment (75% to 50%)? If the industries in question are truly "basic" and *irreplaceable*, it seems clear that City "B" would fare the worse. The collapse of industry "j" would destroy three-quarters of the economic base and, presumably, three-quarters of the service-industry superstructure of City "B" as against a lesser collapse of only one-half the economy of City "A". To illustrate, an example of the disappearance of an irreplaceable, basic industry would be the depletion of the mineral upon which a mining town has been built.

Conversely, it could be argued that if these basic industries "i" and "j" are replaceable, the transition required of City "B" would be easier than that required of City "A" in that fewer workers would be involved in the industrial-occupational readjustment. This latter approach, however, is really not so much a consideration of the generally accepted concept of "basicness" with which we are concerned as it is a consideration of the functional adaptibility (or industrial mobility) of the cities involved.

Which, then, is the preferred index? In intra-city comparisons the rank orders and even the relative values of the two indices are identical; therefore, the preference would be for the total-employment form as it is statistically much the easier to construct. In inter-city comparisons, the preference probably would be for the statistically-more-complicated total-surplus-worker form which implicitly incorporates the breadth of the economic base (or, conversely, the degree of local self-sufficiency) into the measure.

III. An Empirical Application of the Indices

Certainly it is appropriate at this point to apply these indices to empirical data to illustrate their distinctiveness. In fact, there is almost a moral obligation to justify the aforegoing trial of the reader's patience by conclusively demonstrating that the careful distinctions drawn above embody more than mere mental exercise. In Table I the five leading industries in each of six large metropolitan areas in the United States have been assembled and ranked according to the value of the two

TABLE I—The Five Leading Industries in Six Large Metropolitan Areas as Identified by the Index of Local Specialization, 1950

Industry	$\dfrac{\dfrac{e_i}{E_i}}{\dfrac{e_t}{E_t}}$
Detroit	
Motor vehicles and motor vehicle equipment (mfg.)	18.22
Office and store machines and devices (mfg.)	2.98
Drugs and medicines (mfg.)	2.42
Advertising	2.04
Paints, varnishes, and related products (mfg.)	1.99
Pittsburgh	
Blast furnaces, steel works, and rolling mills (mfg.)	14.03
Glass and glass products (mfg.)	7.66
Miscellaneous petroleum and coal products (mfg.)	5.94
Railroad and misc. transportation equipment (mfg.)	4.86
Pottery and related product (mfg.)*	2.75
Cleveland	
Paints, varnishes and related products (mfg.)	6.50
Other primary iron and steel products (mfg.)	3.44
Primary nonferrous industries (mfg.)	3.37
Miscellaneous machinery, except electrical (mfg.)	3.27
Aircraft and parts (mfg.)	3.22
Philadelphia	
Ship and boat building and repairing (mfg.)	4.07
Railroad and misc. transportation equipment (mfg.)	3.84
Miscellaneous textile mill products (mfg.)	3.55
Leather: tanned, curried, and finished (mfg.)	3.47
Petroleum refining (mfg.)	3.29
New York	
Apparel and accessories (mfg.)	3.77
Security and commodity brokerage, and investment companies.	3.52
Water transportation	3.24
Miscellaneous fabricated textile products (mfg.)	3.09
Drugs and medicine (mfg.)	3.03
San Francisco	
Ship and boat building and repairing (mfg.)	6.28
Water transportation	4.60
Air transportation	3.94
Petroleum refining (mfg.)	3.22
Canning and preserving fruits, vegetables, and sea foods (mfg.)	2.91

Source: Based on data from *U. S. Census of Population: 1950, Detailed Characteristics,* Table 79.

   * Supplants "Not specified food industries" which was considered to be too ambiguous to be comparable to the other industry classifications.

indices employed above. Even the most cursory examination of Table I will confirm the above conclusion that, if the objective is to rank local industries according to the relative role they play in the economic base of their metropolitan area, strikingly different results would be obtained depending on the investigator's choice of indices.

Not only are the rank orders of the industries under the two indices highly dissimilar, but even the specific industries within the group change very noticeably. In four of the six metropolitan areas shown only two of the top five industries as identified by one index were repeated in the top five industries as identified by the other index. In the remaining two metropolitan areas (Detroit and Pittsburgh) only one industry "repeated." Of the full eleven large metropolitan areas studied, the average number of industries appearing in the top five ranks of both indices is slightly less than two out of five (21 "repeats" in 11 cases). The obvious explanation of this divergence is that industries with a high *index of local specialization* are often too small to be quantitatively significant in the economic base of their metropolitan areas.

In addition to illustrating the substantial dissimilarity of the rank order of local industries as determined by these two distinct indices, Table II offers some incidental but interesting by-products on the nature of comparative urban economic bases. For example, Detroit and Pittsburgh provide excellent illustrations of highly specialized manufacturing economies in which a single industry (census-defined) accounts for an overwhelming majority (approximately 84% and 55% respectively) of its locality's "surplus", and presumably export, workers. Further, again referring to Table II, Cleveland and Philadelphia provide excellent illustrations of more *diversified*

manufacturing economies in which there is a broader economic base. Of the latter two localities, Philadelphia exhibits the greater substantive and functional diversification in that Cleveland's basic activities are heavily concentrated in durable goods manufacturing, whereas, Philadelphia's basic activities are rather evenly distributed between durable and non-durable goods manufacturing with a slightly greater emphasis on non-durable goods. Finally, New York and San Francisco provide excellent illustrations of more *generally diversified* economies with economic bases which draw more heavily on non-manufacturing industries. In fact, a random set of five industries would probably be no more dissimilar than those representing the economic base of San Francisco.

Earlier, in the theoretical section of this study, preference was expressed for placing primary reliance on the *index of surplus workers* in regional economic base studies. The reader is encouraged to compare the information presented in Tables I and II to satisfy himself that this index is the more useful measure. However, it will be recalled that if interregional comparisons are to be made it is necessary to convert the *index of surplus workers* to a relative form by relating the absolute number of "surplus" workers in a particular industry to either the locality's total employment or total "surplus" workers. Further, a distinction was drawn between these two relative forms of the index on the basis of an *a priori* judgment that cities (metropolitan areas) differed markedly in their degree of self-sufficiency, *i.e.*, their ratio of "surplus" workers to total employment.

This *a priori* position is strikingly illustrated and the careful distinction drawn between the two relative forms on the *index of surplus workers* is fully justified by the evidence presented in the third

TABLE II—The Five Leading Industries in Six Large Metropolitan Areas as Identified by the Absolute, Total Employment and Total Surplus Forms of the Index of Surplus Workers, 1950

Industry	$e_i - \frac{e_t}{E_t} E_i$	$\dfrac{e_i - \frac{e_t}{E_t} E_i}{e_t}$	$\dfrac{e_i - \frac{e_t}{E_t} E_i}{\sum \left[e_i - \frac{e_t}{E_t} E_i \right]}$
Detroit			
Motor vehicles and motor vehicle equipment (mfg.)	317,339	26.62	84.01
Fabricated steel products (mfg.)	13,940	1.17	3.69
Office and store machines and devices (mfg.)	4,431	.37	1.17
Other primary iron and steel industries (mfg.)	3,261	.27	.86
Rubber products (mfg.)*	3,068	.26	.81
Pittsburgh			
Blast furnaces, steel works, and rolling mills (mfg.)	124,191	15.35	54.58
Electrical machinery, equipment and supplies (mfg.)	19,529	2.41	8.58
Glass and glass products (mfg.)	13,584	1.68	5.97
Railroads and railway express service	12,515	1.55	5.50
Fabricated steel products (mfg.)	8,238	1.02	3.62
Cleveland			
Miscellaneous machinery, except electrical (mfg.)	25,269	4.10	16.28
Fabricated steel products (mfg.)	16,880	2.74	10.88
Motor vehicles and motor vehicle equipment (mfg.)	16,811	2.73	10.83
Blast furnaces	13,862	2.25	8.93
Electrical machinery, equipment and supplies (mfg.)	11,387	1.85	7.34
Philadelphia			
Apparel and accessories (mfg.)	29,599	2.06	11.27
Electrical machinery, equipment and supplies (mfg.)	23,605	1.64	8.99
Petroleum refining (mfg.)	15,185	1.06	5.78
Ship and boat building and repairing (mfg.)	12,359	.86	4.71
Printing, publishing, and allied industries (mfg.)	12,240	.85	4.66
New York			
Apparel and accessories (mfg.)	256,853	4.83	18.91
Printing, publishing and allied industries (mfg.)	66,051	1.24	4.86
Real estate (incl. real estate-insurance-law-offices)	65,031	1.22	4.79
Food and related products (whlse)	63,848	1.20	4.70
Insurance	57,832	1.09	4.26
San Francisco			
Federal public administration	22,805	2.64	10.36
Ship and boat building and repairing (mfg.)	12,787	1.48	5.81
Water transportation	11,607	1.34	5.27
Insurance	11,317	1.31	5.14
Eating and drinking places	9,625	1.11	4.37

Source: ibid., Table I.

*Supplants "Local public administration" because this latter activity appears, on the basis of subjective judgment, to be almost exlusively a local service activity.

column of Table III. The "proportion of surplus to service workers," the usual form in which the degree of local self-sufficiency is expressed, varies from a low of 1 : 1.99 in Chicago to a high of 1 : 4.47 in Philadelphia. To illustrate the application of the *index of surplus workers* in its various forms, compare the New York apparel industry with the Detroit automobile industry. These two industries with 257,000 and 317,000 "surplus" workers, respectively, are com-

TABLE III—SURPLUS WORKERS AS A MEASURE OF THE CHARACTER OF THE ECONOMIC BASE OF THE ELEVEN LARGEST METROPOLITAN AREAS IN THE UNITED STATES, 1950

Metropolitan area	Total employment	Total surplus workers	Proportion of surplus to service workers*	Surplus workers in top five industries	Surplus workers in top five industries as percent of total surplus workers
Chicago	2,361,782	790,119	1 : 1.99	295,413	37.39
Detroit	1,192,280	377,743	1 : 2.16	342,102	90.56
Pittsburgh	808,897	227,550	1 : 2.55	178,057	78.25
New York	5,314,028	1,358,318	1 : 2.91	510,335	37.57
San Francisco	864,976	220,228	1 : 2.93	68,141	30.94
Cleveland	615,723	155,179	1 : 2.97	84,209	54.27
Boston	914,953	220,146	1 : 3.16	82,610	37.53
Los Angeles	1,690,395	404,704	1 : 3.18	138,569	34.24
Baltimore	527,911	121,356	1 : 3.35	48,180	39.70
St. Louis	676,881	138,469	1 : 3.89	44,645	32.24
Philadelphia	1,437,923	262,665	1 : 4.47	92,988	35.40

Source: Based on data from *U. S. Census of Population: 1950, Detailed Characteristics*, Table 79.
* "Service" workers are simply the difference between total employment and "surplus" workers.

parable in *absolute* size, however, since the New York Metropolitan Area is almost five times as large as the Detroit Metropolitan Area the Detroit automobile industry gains five-fold in *relative* "basic" importance. This is reflected by the values of 26.62 to 4.83 registered by the total-employment form of *index of surplus workers* for the Detroit automobile industry and the New York apparel industry, respectively.

A further refinement in base measurement can be made by considering the breadth of the economic bases of the two areas. Now applying the total-surplus-worker form of the *index of surplus workers*, the slightly greater degree of self-sufficiency characteristic of the New York Metropolitan Area (1: 2.91 as against 1 : 2.16) is incorporated into the measure and, accordingly, the New York apparel industry gains slightly in basic importance relative to the Detroit automobile industry (values of 18.91 and 84.01, respectively) lessening the latter's dominance from approximately 5½ to 1 to 4½ to 1. That is to say, the total-surplus-worker form of *index of surplus workers* reveals that the automobile industry is about four times as basic to the Detroit economy as the apparel industry is to the New York economy.

The reader is cautioned, that the "surplus" workers figures of Table II (as well as Table III) are the product of the purely mechanical method of assign-

ing all workers in a local industry beyond the locality's *pro rata* share of national employment of this industry to the category "surplus." To the extent that the local consumption pattern differs from the national consumption pattern due to differences in tastes, income or relative price structures, the number of "surplus" workers will differ from the actual number of export workers.[14]

The accuracy of the "surplus" workers figures is also affected by the breath of the industry classification used. Generally, the broader the industry group (*i.e.*, the fewer the number of industry subdivisions) the fewer the number of local "surplus" workers. This is so because aggregation tends to offset "deficit" (import) industries against "surplus" (export) industries. In that the industry subdivision employed in this study are the narrowest (most detailed) employed in the 1950 Population Census, the results of Table III may be defended at least on pragmatic grounds. Thus, with the deviations between local and national consumption patterns having an uncertain and perhaps random effect and our limited industry aggregation tending to slightly understate the number of "surplus" workers, the net effect is probably to slightly overstate the number of de-

pendent service workers or, what amounts to the same thing, to overstate the degree of local self-suffiiecncy.

The last column of Table III indicates the degree of industrial concentration prevailing in the economic base of the eleven largest metropolitan areas. The percent of the total "surplus" workers employed in the five most basic industries varies from a high of over 90% in Detroit to a low of only about 31% in San Francisco. Base concentration is conceptually equivalent to the community putting its export eggs "all in one basket."

While an analysis of local business cycle mechanics in general and the cycle sensitivity of these eleven metropolitan areas in particular is beyond the limited scope of this study, a measure of the degree of concentration in the economic base of a locality provides a possible point of departure for local business cycle analysis. It is true, of course, that base concentration may produce local stability or instability depending on the cycle patterns of the industries of local emphasis. Further, it is also true that random industrial diversification is not a panacea for local instability as "community boosters" too often seem to believe. Even so, local base concentration, other things equal, is probably at least moderately associated with local cycle instability. Consequently, a purely quantitative measure of base concentration would be useful in local cycle analysis if it were supplemented by a more qualitative consideration of the nature of the basic industries themselves (*e.g.*, durable vs. nondurable).

IV. *Conclusion*

After having led the reader along a rather labyrinthian way, it would be well to recapitulate the specific purpose and conclusions of this study of the urban economic base. Fundamentally, our

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[14] It often happens that an industry is characterized by a national market for its product and so the great majority of the workers in a local branch of this industry are producing goods which will be sold outside the local area, even though the locality may have only its *pro rata* share of national industry employment or less. This is a normal situation in markets characterized by a well developed "product differentiation." In a gross sense, the locality both exports and imports this product. Thus, the existence of "product differentiation," areal overlapping of firm product markets, and "cross-hauling" makes necessary the distinction between "gross" and "net" export workers. Obviously, it is "net" export workers which our index yields. Fortunately, it is "net" export workers which is the more useful figure. To illustrate, a national secular or cyclical slump of a particular industry will be shifted from the outside onto a locality to the degree that the locality exports the product in question and, in offsetting fashion, the slump will be shifted from the locality to the outside economy to the degree that the locality imports the product (*i.e.*, exports the unemployment). The net impact of the slump on the locality is reflected in the measure "net" export workers.

purpose has been to devise a tool which when applied to the industry data of a local economy would enable the user to say: "This is the most basic industry in this local economy" and, more specifically, "it is x times as basic as this next most basic industry." In the course of the search for this ideal measure it became clear that, while many indices will serve to identify basic from local service industries, the relative weighting and ranking of these basic industries themselves requires care and discrimination in the choice of an appropriate index.

The *index of local specialization* indicates the importance of any industry to its locality relative to the importance of an industry to the nation. On the other hand, the *index of surplus workers*, which uniquely takes into consideration both the role (*i.e.*, export versus local service) and the size of a local industry, indicates the importance of an industry to its

locality relative to the importance of other industries to the same locality. Thus, the *index of local specialization* reflects the importance of the locality to the industry, considering the size of the locality; whereas the *index of surplus workers* reflects the importance of the industry to the locality, considering the size of the industry. It is a quantitative expression of this latter relationship that has been our objective from the beginning.

Further, by relating an *industry's surplus workers* to total surplus workers, a relative form of the *index of surplus workers* has been constructed which extends the analyst's power of comparison to the point where he can say: "The "A" industry is x times as basic to the "M" locality as the "B" industry is to the "N" locality." If used with care, the *index of surplus workers* in both its absolute and relative form should prove to be a highly useful tool in regional economic base studies.

A Reconsideration of Cost of Capital and a Reasonable Rate of Return

By FRED P. MORRISSEY*

THE greater independence from judicial review provided by the Hope Natural Gas decision (320 U. S. 591-1944) has resulted in new responsibility and authority for utility regulatory commissions. The concurrent abandonment of the fair value principle as the "law of the land" has relieved some of the controversy over rate base and moved the rate of return determination to the forefront. The Supreme Court stated the legal requirements for a fair or reasonable rate of return in the Bluefield decision:

"What legal rate will constitute just compensation depends upon many circumstances and must be determined by the exercise of a fair and enlightened judgment, having regard to all relevant facts. A public utility is entitled to such rates as will permit it to earn a return on the value of the property which it employs for the convenience of the public equal to that generally being made at the same time and in the same general part of the country on investments in other business undertakings which are attended by corresponding risks and uncertainties; but it has no constitutional right to profits such as are realized or anticipated in highly profitable enterprises or speculative ventures. The return should be reasonably sufficient to assure confidence in the financial soundness of the utility, and should be adequate, under efficient and economical management, to maintain and support its credit and enable it to raise the money for the proper discharge of its public duties . . . ."[1]

This decision (particularly since the reinforcement by the Hope Case) has been reduced to 3 criteria: (a) the capital attraction standard, (b) the credit maintenance standard, and (c) the comparable risk standard.

Many utility companies have emphasized the latter two, with particular emphasis on the comparison with other business of corresponding risks.[2] The opponents of rate increases tend to favor the capital attraction standard claiming that a rate of return adequate to attract capital to a utility must also maintain the company's credit (or else it could not obtain the capital) and must be equivalent to whatever rate of return an investor could reasonably expect from alternative investments of comparable risk.

As a result, many rate of return witnesses have adopted this capital attraction criteria as all-inclusive and have sought a rate of return which will be "capital attracting." A common approach is the use of the so-called "cost-of-capital"—a much used and much abused term subject to variable connotation and calculation. One source of confusion is due to the absence of distinction between the definition of "cost of capital" and the approach, method or formula utilized to arrive at this "cost of capital" expressed in percentage terms. In part, the controversy which has been carried on in rate hearings and in the academic and trade journals is directed at whether the term "cost of capital" is synonymous with a fair rate of return, but also is directed at whether a percent figure derived by the so-called cost of capital formula, is an appropriate and fair rate of return. The latter appears to be the real issue.

The major point at issue in this journal has been whether or not the rate of return

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[1] 262 U.S. 679, 692-693 (1923).

[2] For an extreme position see Charles Tatham, Jr., "The Forgotten Factor in Rate of Return," *Public Utilities Fortnightly*, July 2, 1953.

arrived at by a "cost of capital" formula represents a fair rate of return in the period of inflation since 1940.[3] Unfortunately, neither the proponents nor the critics have paid much attention to the more fundamental question underlying the cost of capital device—namely, whether it in itself provides a reasonable and fair rate of return to the public utility *apart from the inflation argument.* Whereas Dr. Thatcher and Dr. Clemens were primarily interested in "whether or not the so-called cost-of-capital return can be adjudged as fair and reasonable without an upward adjustment for inflation . . . ."[4] this paper is aimed at an appraisal of the principles of the "cost-of-capital" technique as applied by witnesses in rate of return cases. The concern here is not with the inflation issue at all, but rather with the underlying assumptions, techniques and alleged advantages of the "cost of capital" method.

While it is customary to speak of *a* "cost of capital" approach, in fact each witness using this terminology employs his own "formula" or method to arrive at representative earnings, dividends, capitalization rates, and capital structure. Accordingly, it was necessary to review the detailed testimony of experienced rate of return witnesses who have utilized the concept.[5] Specifically, investigation was directed at (a) the definition of the term "cost of capital" and whether or not the term so defined was equated to a fair rate of return, and (b) the technique or procedure each used for measuring the cost of capital, especially the most significant and controversial item, the cost of equity capital. Finally, these findings are appraised and conclusions are presented on the appropriateness and relevance of the "cost of capital" techniques to a fair or reasonable rate of return.

Definitions of "Cost of Capital" and Its Relation to a "Fair Rate of Return"

In the definitions of "cost of capital" utilized by rate of return witnesses one finds a fair degree of uniformity. One difference, however, derives from a qualification imposed by two witnesses, Bonbright and Thatcher, on the impact of raising new capital on the present stockholders.

Professor Morton has defined the term as: ". . . . the competitive market price that must be paid to attract new money to this company in view of the alternative investment opportunities with allowances

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[3] For two conflicting views on the inflation issue see: W. A. Morton, "Rate of Return and Value of Money in Public Utilities," *Land Economics*, May 1952, pp. 91-131; and J. C. Bonbright, "Public Utility Rate Control in a Period of Price Inflation," *Land Economics*, Feb. 1951. On the defense of cost of capital formulae and inflation see: E. W. Clemens, "Some Aspects of the Rate of Return Problem," *Land Economics*, Feb. 1954. (Hereafter referred to as Clemens-*Land Economics*); L. W. Thatcher, "Cost of Capital Techniques Employed in Determining the Rate of Return for Public Utilities," *Land Economics*, May 1954. (Hereafter referred to as Thatcher-*Land Economics.*) For other studies on cost of capital and rate of return see: The Federal Communications Commission: "The Problem of the Rate of Return in Public Utility Regulation with Special Reference to the Long Lines Department of the American Telephone and Telegraph Company" (1938). (Hereafter referred to as F. C. C. Study); "Factors Underlying the Rate of Return in Public Utility Regulation" (1938); also *The Public Utilities Fortnightly* has carried numerous articles denouncing "cost of capital" techniques.

[4] *op. cit.*, Thatcher, *Land Economics*, p. 86, and Clemens, *Land Economics*, p. 37.

[5] The witnesses reviewed and the rate case testimony include: David A. Kosh, California Public Utilities Comm'n. (1) Pacific Telephone & Telegraph Co. Applic'n No. 28211, 1947. (2) Pacific Telephone & Telegraph Co. Applic'n No. 29854, 1949. (3) Southern California Edison Co. Applic'n No. 33952, 1954. *James C. Bonbright*, (1) N. Y. Public Service Comm'n. N. Y. Telephone & Telegraph Co., Case 15235 (1951). (2) Illinois Commerce Comm'n. Commonwealth Edison Co., Case 44130 (1954), Exhibit 3 (Preliminary Draft). *Walter A. Morton*, Illinois Bell Telephone Co., Rate case, May 6, 1954. *Ralph E. Badger*, California Public Utilities Comm'n. (1) Pacific Telephone & Telegraph Co. Application No. 28211, December 1947. (2) Pacific Telephone & Telegraph Co. Application No. 29854, May 1949. *L. W. Thatcher*, California Public Utilities Comm'n. Pacific Telephone & Telegraph Co. Applic'n No. 33935, Exhibit 123 & 124, Dec. 1953. *James K. McIntosh*, California Public Utilities Comm'n. Pacific Telephone & Telegraph Co. Applic'n No. 33935, Exhibit 103, Dec. 1953.

Most references are to testimony in telephone rate cases, not by deliberate choice but because of the difficulty of obtaining copies of the voluminous transcript. Extensive quotations are included to avoid insofar as possible any misinterpretation of the witnesses' intentions.

for differences in risk."[6] The F.C.C. Report as well as Dr. Badger and Mr. Kosh appear to use much the same definition.

However, Professor Bonbright added two qualifications, one of which is of great significance: "In a broad sense it refers to whatever rate of return is deemed adequate to maintain sound corporate credit and to permit a public utility company under efficient management to raise new capital *without impairing the integrity of the existing investments.*"[7] [Professor Thatcher specifically substitutes "existing investors."] The qualification added here is vital to the welfare of present security holders. Practically any corporation with an earnings position can raise capital. The debt-free Hope Natural Gas Co. in 1944 certainly could have issued debt securities and thus attracted substantial amounts of capital at 3% or 4%.[8] Common stock can be sold, even to existing stockholders often, if the offering price is favorably low. It is elemental that consideration must be given to the effect of raising new capital on the position of present security holders —a situation already recognized by law in "pre-emptive right" requirements in most states. Consequently, any definition ignoring this situation is deficient and if adhered to may work an injustice on existing security holders.[9] While the acceptance of Dr. Bonbright's definition may merely shift the burden to a determination of what constitutes impairment

of the integrity of the existing investors, in any case it indicates that the first definition of "cost of capital" has a great weakness, if presented as an equivalent of fair rate of return.[10]

When one explores the testimony of witnesses to determine if "cost of capital" is equivalent to a "fair rate of return," the issue becomes very confused and contradictory. The F.C.C. report initially equates a reasonable rate of return and cost of capital:

"The reasonable return, therefore, is fundamentally that return which will enable the utility to establish a credit position such as will induce a continual and adequate supply of capital to enter the business, as and when required to finance necessary extensions and improvements. The sum necessary to insure confidence in the financial soundness of the utility and to maintain its credit is represented by the reasonable "cost of capital."[11]

Later, however (at p. 154) the report loses this definiteness and suggests that the "cost of capital" should provide a minimum below which the rate of return should not fall:

"It should be emphasized that the results of the above cost-of-capital studies represent to a considerable extent hindsight appreciation of possibilities which could not be foreseen. For this reason, these estimates of cost of capital in the best situations are properly usable only as an indication of the minimum below which the rate of return may not reasonably be fixed. They offer, in other words, some indication respecting the boundaries of the area of confiscation. The fair rate of return for any particular utility may, and usually will, be somewhat above the level indicated by the cost of capital in the optimum investment situation . . . ."

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[6] Testimony in Illinois Bell Telephone Rate Case, May 6, 1954. P. 3.

[7] Testimony before the Illinois Commerce Commission, Case 41130, E. 3.12. This definition is substantially repeated by Dr. Thatcher in his article in *Land Economics*, May 1954, page 86.

[8] For a thoughtful discussion of this see: J. C. Bonbright, *American Economic Review*, Proceedings, Vol. XXXVIII, No. 2, May 1948, pp. 475-6.

[9] Mr. Kosh would deny any distinction between present stockholders and prospective investors and his approach to cost of capital assumes no distinction. See his Testimony, Application 33952, Southern California Edison Case, Feb. 3 & 4, 1954, Transcript 5187.

[10] One other obvious serious shortcoming of the "capital attraction" test as presented lies in the fact that the supply of capital is not perfectly elastic or inelastic. What rate will attract $50 million will not satisfy the suppliers of $250 million in the same period. Further as noted below, a rapidly expanding utility may require large amounts of new plant and therefore substantial quantities of new capital— a situation which may well result in attrition of earnings to the detriment of present security holders.

[11] *Op. cit.*, F. C. C. Report, pp. 20-21.

Similarly, Dr. Ralph Badger, tesifying as a witness for protestants before the California Public Utilities Commission[12] did not equate the two, and in fact agreed with the F.C.C. report that "cost of capital" was a minimum below which confiscation would result:

"The fair rate of return is that rate of return which the regulated utility company should be permitted to earn on its predetermined rate base, and is, in my opinion, a matter for judicial determination. It is my opinion, however, that one of the important elements which should enter into the fair rate of return is the cost of money or capital to the regulated company."

Later at Transcript 3781 Dr. Badger amplifies.:

". . . . It is my opinion that the fair rate of return will be found between (1) a lower limit which might be considered as a confiscatory rate of return, a return less than current capital costs, and (2) a return so high as to be uneconomical and burdensome to the rate payer."

A protestant witness for the U. S. Treasury, David A. Kosh suggested that cost of capital and fair rate of return *may* be equal, but he had some doubt on the matter:[13]

"The cost of capital, as I have developed it, is the largest and most significant factor in the determination of the fair rate of return. The cost of capital may well be equal to the fair rate of return. At times, and in order to be conservative, the fair rate of return might be somewhat higher than the cost of capital . . . At the present stage of development of thinking on rate of return that differential would seem to me to be a matter of judgment for the Commission. However, in view of the conservative approach to cost of capital, as I have determined it, it would seem to me that the differential should be rather small.   As a

matter of general judgment I would say that it should be of the order of magnitude of one quarter of one per cent."

Later, at transcript 4082, Mr. Kosh claimed that if a differential is necessary it must be arrived at through judgment rather than statistical analysis:

"I want to make one thing perfectly clear first. As far as the cost of capital is concerned, that is subject to statistical and economic analysis. Beyond that, in the present stage of development of thought on the subject, the next step [differential between cost of capital and rate of return] is one of judgment."

Testifying in February 1954 before the same Commission[14] Mr. Kosh altered his position somewhat. Specifically, at transcript 5153, he claimed that a fair rate of return is synomynous with a "full cost of capital" whereas a "bare bones" cost of capital lies at the bottom of the range of reasonableness.   When pressed for a method or formula to get at the difference between a "bare bones" and a full cost of capital he claimed that none exists. Apparently the difference depends upon how precisely the witness figures, or in the jargon of the security analyst, "how sharp a pencil one uses."

". . . . if every point where you had to make a judgment you resolved that judgment in the direction of a lower figure, then I think the end result would tend to be close to the bare bones. If you resolved things in the other direction or on a reasonable basis, then you tend to get away from the bare bones cost . . . ."

Thus Mr. Kosh does not define "bare bones" cost of capital as a cash cost as Dr. Thatcher does but rather in terms of whether one uses *liberal* estimates of cost of additional debt and preferred stock financing, of pressure, of capital structure, of earnings-price ratios, etc. There are no objective facts or statistical data

[12] P.T.&T. Applic'n No. 28211, Dec. 3 & 4, 1947, transcript 3675. Later, Dr. Badger became a critic of the "cost of capital" school as evidenced in his article in *Public Utilities Fortnightly*, July 3, 1952.

[13] Before the California Public Utilities Commission, Dec. 5, 1947 and January 12 & 14, 1948, P.T.&T. Application No. 28211, Transcript 4073-4.

[14] Application 33952, Southern California Edison Case, transcript 5140 et seq.

upon which Mr. Kosh can base the differential between a "bare bones" cost of capital and a "full cost of capital" which he equates with a reasonable rate of return. It appears, then, that what Mr. Kosh claimed in 1948 was "subject to statistical and economic analysis" is now a question of liberal estimates and resolutions of judgments.

Dr. Morton threw more doubt on the preciseness of the cost of capital technique in relation to the fair rate of return when he stated:

"With a fair value rate base, on the other hand, we can achieve a substantially reasonable result simply by using the cost of money, *with the necessary corrections for business conditions and other unmeasured factors*, as a measure of a fair rate of return."[15] (Italics supplied).

However, Dr. L. W. Thatcher[16] is willing to agree that a fair rate of return and "cost of capital" are synonymous if in calculating the latter we allow something for retained earnings and for costs of floating new issues of securities, i.e., a requirement which may bring us to Mr. Kosh's "full cost of capital." If the "bare bones cost of capital" is used, and here Dr. Thatcher defines "bare bones" as being the cash cost, (the actual cash payments on interests and dividends for the year), the resulting return falls short of a fair rate of return. Another witness, James McIntosh,[17] would not disagree with Dr. Thatcher since he equated "cost of capital" with a fair rate of return provided that some allowance in excess of dividends is provided for retained earnings.

It appears that Professor J. C. Bonbright similarly equated "cost of capital" (including an allowance for retained earnings) and a reasonable rate of return in testimony presented before the New York Commission in 1951.

"I define it [reasonable rate of return] as a rate designed to maintain sound corporate credit and to enable a well managed and well financed company to secure required amounts of new capital on terms fair to existing investors . . . I include in cost of capital all allowances that are generally covered under the head of a reasonable rate of return."[18]

However, in his testimony in the Commonwealth Edison Case,[19] Professor Bonbright suggests that identification of the two is erroneous and introduces a new version of "bare bones cost of capital"— one not equivalent to "cash cost" but rather one which exceeds "cash cost" by an allowance for earnings above interest and dividend requirements. In other words, what Dr. Bonbright now refers to as a "bare bones cost of capital," and which falls short of a fair rate of return in his opinion, is the same concept that witnesses Thatcher, McIntosh, and Kosh would claim was the "full cost" and adequate for a reasonable rate of return.[20]

Thus, one finds Professor Bonbright and Dr. Badger utilizing a "cost of capital" technique but denying equivalence of the result to a fair rate of return. The F.C.C. study supports them in their view. On the other hand, Mr. Kosh, Dr. Thatcher and Mr. McIntosh agree that "cost of capital" and a fair rate of return are synonymous providing the "bare bones cost of capital" is not employed. Professor Morton would tend to agree with the latter group *providing* a

[15] Testimony for Illinois Bell Telephone Company, May 6, 1954, P. 7.

[16] *Op. cit.*, Thatcher, *Land Economics*, May 1954, pp. 86-8, and Testimony before Calif. Public Utilities Commission, Application No. 33935, Ex. 123, Feb. 17, 1954.

[17] Witness for U. S. Government, General Services Administration, before the Calif. Public Utilities Commission, Application No. 33935, Exhibit 103, pp. 5-6, Dec. 1953.

[18] Before the New York Commission, Case No. 15235, July 1951, Transcript 1979.

[19] Illinois Commerce Commission, Case 41130, Ex. 3.12.

[20] Professor Walter C. Morton utilized a "cost-of-capital" formula in his testimony as a witness for Illinois Bell Telephone Co. but claimed the resulting cost of capital was only applicable if a fair value rate base was used, or some other appropriate adjustment was made for the changes in the price level. In other words, Dr. Morton's objection is principally based on the inflation argument.

fair value rate base was used, yet he suggests the necessity of adjustments for "business conditions and other unmeasured factors." On the subject of a "bare bones" cost of capital, one finds at least three separate and distinct versions. One is stated in terms of the cash cost, another in terms of the degree of liberality of calculations used, and a third in what Mr. Kosh, Dr. Thatcher and Mr. McIntosh would call the "full" cost of capital and which they would equate to a fair and reasonable rate of return. There does appear to be a degree of agreement; whenever a witness uses the term "bare bones" cost of capital, to that witness it appears to mean a rate of return that is near the lower end of the range of reasonableness. At best one can say that there is a distinct lack of unanimity of opinion among witnesses who have favored the "cost of capital" approach, as to the significance of their results in rate of return proceedings.

Techniques of Computing "Cost of Capital"

The methods employed in arriving at the "cost of capital" are not uniform from one witness to another, yet there is an underlying thread common to most of them—and Professor Thatcher has demonstrated this general approach.[21] First, a utility's capitalization or long-term capital is established as 100% and is segregated into (a) the long-term debt component, (b) the preferred stock component, and (c) common stock equity component, including earned surplus. The next step is to compute the cost of debt capital, the cost of the preferred stock (in each case the interest and dividend costs plus flotation and amortization of premium or discount are included) and finally the cost of the common equity capital. These component costs are weighted on the basis of

their proportion in the capital structure and an average determined. The costs of the senior securities are not subject to much controversy since the actual imbedded costs of debts and preferred are used, plus the current cost of new senior financing where this is clearly contemplated in the near future. But the different methods used in deriving the cost of equity funds raise unresolved issues and will be examined here.

First, however, it should be noted that many of the "cost of capital" proponents stress the necessity of adjusting the capital structure to conform to some standard, on the assumption that debt capital is cheap money and a high debt—low equity ratio will thereby reduce the computed cost.[22] This adjustment to an ideal structure of course introduces a judgment factor which is not only difficult to substantiate but also difficult to refute. The available studies directed at determining an optimum capital structure are not conclusive and provide neither the utility nor opposition witnesses with a pinpointed optimum. It is clear, however, that present tax laws favor debt financing and increase inflexibilities if carried far.

Since many witnesses frequently assume a higher precentage of debt in their calculations than is actually the case, it may be that we are experiencing a swing of the pendulum on the part of commissions and opposition witnesses, because previously utilities were accused of excessive trading on the equity, now they are urged and in some cases forced to increase their debt. Clearly, Clemens could be in error when he states: ". . . . The acceptance of any given [capital] structure as a basis for determining the cost of capital carries with it no regulatory commitment or compulsion relative to

[21] *Op. cit.*, *Land Economics*, May 1954, p. 86.

[22] See for example: Clemens, *Land Economics*, February 1954, p. 36-37; and Thatcher, *Land Economics*, May 1954. pp. 88-90 and the discussion therein concerning this problem,

the company's financial policies."[23]   If the Commission adopts a rate of return of 6% assuming a 35% equity ratio and the company has favored and utilized an equity ratio of 50%, then unless the company adopts the capital structure assumed by the Commission, the return on the common equity will be deficient—a result which alone may depress the market price of the stock and force compliance by the company.

As indicated above, the most serious debate centers around the determination of the cost of equity capital to the public utility corporation.   Since the common equity holder's claim is of a residual nature, he enjoys no legal commitment to receive either earnings or dividends. What he does receive is a proportionate claim to the future earnings of the company, and what he purchases is basically expected future income, income which may be received either in terms of dividends or capital appreciation. It should be obvious that the historical amounts which have been paid out in dividends to common stockholders, or the earnings realized, cannot be accepted as determinative of the cost of equity capital for the purpose of reaching return requirements.   The very residual nature of common stock denies that historical dividends or earnings of past periods are guaranteed for the future, and any procedure which mechanically assumes that investors are buying past earnings or dividends (or that these past earnings or dividends are the best approximation to future requirements) is contrary to reality.

The "cost of capital" proponents commonly determine this cost of equity capital by means of earnings-price ratios or dividend-price ratios, or both, and assume that the rates at which earnings or dividends are capitalized in the recent past represents the cost of common

equity.   The first issue then is whether investors are buying earnings or dividends and accordingly whether one should use earnings-price ratios or dividend-price ratios in determining the cost of equity capital. This matter presents a real dilemma to the cost of capital witness because in most cases a different "cost" figure will result depending upon which is used.   Further, the use of the dividend-price approach introduces the additional problem of a "payout" ratio—the percentage of net earnings paid out in common stock dividends.

In brief, the use of earnings-price ratios assumes that investors are buying the future earnings of the company, and the price paid for these earnings takes into account all other relevant factors such as growth, differences in competition, payout, efficiency of management, etc. The F.C.C. reported:

"The ratio of dividends and earnings to the market price of common stock *may serve* as an indication of the current cost of equity capital. Since the entire return above fixed obligations and preferred stock requirements belongs to the common stockholder, and since the available earnings are the measure of the ability of the company to pay dividends either currently or in the future, the earnings-price ratio is regarded as more significant than the dividends-price ratio.   In determining the prices they are willing to pay, investors take into consideration the dividend policies of corporations and the proportion of earnings paid out in dividends . . . . It also appears that earnings are more closely related to credit maintenance than are dividends . . . . It does not follow that dividend payments have no bearing on credit, but rather that the effect is apparently subordinate to that cf earnings . . . . In any event, however, it seems generally to be conceded that the long-run average earnings-price ratio more accurately than any other single factor, reflects the investor's composite evaluation of all fundamental influences affecting the corporation."[24]

[23] *Ibid.*, p. 36.

[24] *Op. cit.*, p. 75-76.

Similarly Mr. Kosh agreed that the earnings-price ratio for one company reflects the market evaluation of that company's depreciation policy, pricing, dividend policy, etc., and required no adjustment. If, however, he said, the analyst is deriving a cost of equity for Company A with a payout of 80%, from the earnings-price ratio of Company B with a payout of 95%, then an adjustment may be in order.[25]

In his use of the earnings-price ratios Dr. Badger put so many restrictions and qualifications that they became practically meaningless:

". . . . It is my opinion, however, that where properly averaged, where due weight is given in the computation of average earnings: price ratios to future or anticipated earnings, and where proper attention is given to unusual dividend experience, and where other aspects of comparability are properly recognized and treated, that the use of such earnings: price ratios is valid, proper evidence to be used as an indication of the cost of equity money. Where the earnings of a corporation and where the dividend record of a corporation are reasonably constant over a long period of time, *where earnings of a given year or where average earnings of an immediately past period closely approximate future earnings*, and where dividend payments are regular and are approximately equal to or in excess of earnings, then the use of earnings: price ratios, predicated upon the use of a given year's earnings related to the average market price for that year constitutes a proper statistical approach."[26] (Italics supplied)

Dr. Badger does not indicate how "due weight" should be given "to future or anticipated earnings" or how to determine if "average earnings of an immediately past period closely approximate future earnings," and thus validate the use of earnings: price ratios. In fact he seems to be unaware that the raison d'etre for the rate proceeding is to deter-

[25] *Op. cit.*, California Public Utilities Commission, Application 28,211, transcript 4004.
[26] Before the California P.U.C., Application 28211, transcript 3697 et seq.

mine the allowable future earnings. With these limitations and qualifications noted, however, Dr. Badger was willing to accept the earnings of Pacific Telephone for 1936-46 as sufficiently representative:

"The year to year variations were indeed small and it is my opinion that under such circumstances the earnings for any given year or for an average of a group of years was the best indication that was available at any given time as to what future earnings were going to be. Thus from a practical point of view, present earnings at a given moment were the equivalent of anticipated future earnings. [Transcript 3754] . . . . I therefore believe that the earnings: price ratio of Bell Telephone Company common stock and utility company common stocks are good evidence of investor expectation [of] rate of return." (Transcript 3756.)

It may be that Dr. Badger understood the insurmountable difficulties that were contained in his limitations of the use of the earnings: price ratios and did not wish to rely upon the necessity of documenting his result statistically, because at transcript 3960 he stated that the result was largely a judgment figure:

". . . . Of course, as I have stated in this case and as I think I stated in both direct and cross examination in Oregon, the final figure, however it is arrived at, must always be subject to an element of judgment. As a matter of fact, the final figure is a judgment figure, and whether or not it is the termination of a series of mathematical computations or whether it is a statement of an end result of a series of mathematical computations or whether it is a statement of an end result supported by the wide range of data, the figure, nevertheless, is a judgment figure and the 6.70 figure [cost of common stock equity] which was used in Oregon was a judgment figure, regardless of how it was worked out mathematically, and the figure 6.85 per cent today, or as used in this case, is likewise a judgment figure."

Despite his acceptance of the earnings of the 1936-46 period as representative

in December 1947, Dr. Badger, before the same Commission in Application No. 29854, May and June 1949, developed a new approach to the use of earnings: price ratios, although he claimed he merely changed the facts. The major alteration in his use of these ratios was the introduction of a "normalization" process—a subjective adjustment of the actual ratio to what Dr. Badger thought the investor thought it was—at transcript 3098-9 he explains:

"For example, in normalizing the earnings-price ratio for the year 1947, the actual earnings: price ratio in that year was 4.72. In an effort to normalize earnings for that year I tried to put myself in the position of an investor in that year to determine whether or not in his opinion he would conclude that the earnings of the company for that year were going to be the average normal future earnings subsequent to 1947. If I had come to the conclusion that the investor in 1947 was of that opinion then it would be unnecessary to do any normalizing. The earnings-price ratio itself would have been a representative earnings-price ratio."

The firmness of Dr. Badger's conclusion that the earnings-price ratio for 1944-48 was unrepresentative of investor's expectation in that period is indicated in the amount of the adjustment for "normalization." The actual earnings-price ratio for A.T. & T. of 5.51 for 1944 was normalized at 6%; the 1945 ratio of 5.05 was increased to 6% while the ratios for 1946 and 1947 were increased from 5.65 and 4.72 to 6.50 and 7.0 per cent respectively.

It is not necessary here to investigate the formula or criteria used in this normalization process. The point here is simply to indicate the variability of approach and lack of precision in the earnings: price ratio approach. Thus Dr. Badger felt it necessary to adjust upwards the actual ratios by .49, .95, .85 and 2.28 percentage points for the years 1944, 1945, 1946 and 1947 respectively.

The witness's judgment on the cost of common equity rose from 6.85% in 1947 to 8.37% for the historical cost of common equity in 1948, while the incremental cost of common equity was established at 9.14% in 1948. All this with no change in the "basic approach or philosophy concerning the analysis of cost of capital . . . ."

Witnesses Morton, Thatcher, McIntosh and Bonbright have tended to place greater reliance on dividend-price relationships than did Mr. Kosh, Dr. Badger, or the F.C.C. study. The use of dividends-price data assumes that price is a function of current dividends rather than of earnings, and that investors in public utility equities want an investment similar in many respects to a debt security but with a rate of return higher than a credit instrument. Mr. McIntosh analysed the investor appraisal of A.T. & T. common stock based on dividend-price ratios and proceeded to apply the cost of equity capital determined for A.T. & T. at a 6% yield basis and 85% payout, and 10% for underpricing and cost of financing, to the Pacific Telephone and Telegraph Co.[27] Dr. Bonbright essentially followed this same method in the New York Telephone case, with the exception that a 75% payout ratio was incorporated.

In the Illinois Bell Telephone case, Professor Morton states his method of determining the cost of equity as follows:

[27] A review of Mr. McIntosh's testimony reveals some interesting facts about the precision of the method involved. At page 51 of Ex. 103, Application 33935, California Public Utilities Commission, Mr. McIntosh states: "Again, current and past experience would indicate that a pay-out ratio of 85% for the Pacific Telephone Company would be *more than reasonable*." One is forced to ask why 85% is used if it is *more* than reasonable. Similarly at page 65 does the witness adopt an unreasonable and overadequate allowance for pressure and corporate costs of financing? "It would be my opinion that an allowance of 6% for pressure and corporate costs of financing would be reasonable and adequate. However, to be conservative, I will adopt a 10% allowance for underpricing and corporate costs of financing in my determination of cost of equity."

"I used three methods; first, the alternative investment opportunities in other types of equity securities; two, the market experience of A.T.&T. stock itself, and three, the actual cost of money to the Bell System, based on postwar issue prices . . . In view of the fact that the cost of money to the average industrial would be higher than for the telephone business because of the risks involved, I have used the market dividend yield and earnings-price ratio of the common equity for the electric power industry as a measure of the cost of equity money to the telephone industry.

. . . . For this purpose [the cost of equity money to the electrics] I used high grade electric utilities as found in Moody's 24 Utilities Index. Instead of determining the relationship between earnings and market price in one step, the cost of equity money to these utilities is analysed in two steps, first by determining the relationship of dividends to price, and then by analyzing the earnings in excess of dividends which the investors expect in the case of electric common equity."[28]

Dr. Morton found average yields of 6% for 1939-53 and 5.6% for 1949-53, and arrived at a required yield of 5.8% for the electrics which, together with a payout of 70-75% and underpricing of 10-12%, gave a cost of equity of 8¾ to 9¼%. His second approach, via the yield on A.T. & T. stock, provided a dividend cost of 6%, which together with 10% underpricing and a payout of 70-75% gave an earnings requirement of 9.1% on common equity. He concluded the cost of equity money in this case to be 8¾ to 9¼%.

Before the California Commission, Dr. Thatcher[29] used both the earnings and dividend approach applied to American Telephone & Telegraph stock, to Pacific Company stock, and to a "common stock of the type of the Pacific Company," although he noted strong preference for the dividend method. In the California case, Professor Thatcher (and Mr. Mc-

Intosh as well) introduced a variation of the dividend-price ratio device—the dividends-net-proceeds ratio which relates the historical dividends per share to the net proceeds of the public sale of stock to the issuing company, a method whereby underpricing and costs of financing are already provided for and no further adjustment on that account is necessary. The assumptions involved are the same as in the use of dividend-price ratios and the procedure can also be used as an earnings-net-proceeds method. The five approaches of Dr. Thatcher to cost of equity capital resulted in 4 different answers. First, Dr. Thatcher computed the earnings requirement for A.T. & T. on the dividends-net-proceeds basis and arrived at 8.23% with an 80% payout. Next he utilized a dividends-price ratio of 6% for a stock of the type of Pacific Telephone stock, allowed 10% discount for financing and underpricing and a payout of 80%, and arrived at 8.33% as the cost of equity. Third, he used earnings-price ratios of 7.5% (based on a general study) with a similar 10% for financing and underpricing to repeat the 8.33%. His fourth and fifth approaches involved the calculation for the Pacific Company of dividend-net-proceeds (with 80% payout) for a cost of 8.76% and the earnings-net-proceeds for a cost of 8.36%. Of these five estimates, the two derived from market data for the Pacific Company were the highest, 8.76% based on dividends-net-proceeds and 8.36% based on earnings-net-proceeds.

Using these data, Dr. Thatcher estimated the cost of common stock capital for the Pacific Company to be within the range of 8.25% to 8.50%. But here he introduced a new element; namely, that the allowed return on equity *should vary depending upon the ownership of the stock.* At page 38 of his prepared testimony, we see this interesting revelation:

[28] *Op. cit.,* p. 14-15.
[29] *Op. cit.,* Ex. 123, p. 36 & Ex. 124, Schedule 19.

"Q. [by Mr. Holm] Mr. Thatcher, how do you reconcile a range of 8.25% to 8.50% for the cost of equity capital, when your own figures for such a cost as shown in Sections D and E were 8.35% and 8.75%?

A. If I were to adopt the higher percentage figure of Sections D and E as representing the cost of equity capital to the Pacific Company, I would apply this average figure to ten percent of Pacific's total equity capital only since the other ninety percent is obtained from A.T.&T. Company. Assuming that 8.35% is the estimated cost of equity capital obtained from A.T.&T. Company and 8.56% for the portion obtained by Pacific through its own stock issues, the average weighted of the two rates would be 8.37% (8.56% x .10 plus 8.35 x .90 ÷ 100 = 8.37%). An analyst might be prompted to recommend a figure for the cost of equity closer to 8.50% than the midpoint of 8.25% and 8.50%."

If one wishes to follow Dr. Thatcher's suggestion to the logical conclusion, an analyst should investigate the cost of equity capital to each of the 10,000 individual investors in Pacific Telephone stock, and perhaps also the similar cost for the 1,300,000 individual stockholders of the American Telephone & Telegraph Company.

Discarding as inappropriate the earnings-price and dividends-price ratios of Commonwealth Edison Corp. in his testimony for that company, Dr. J. C. Bonbright utilized instead earnings-price and dividends-price ratios, payout ratios and earnings-net-proceeds and dividend-net-proceeds ratios of comparable electric companies.[30] The comparable companies chosen were the 15 "giants of the electric-utility industry." He developed 8% as a representative earnings-price ratio, when adjusted upwards by 10% for under-pricing and flotation costs gave 8.9% as one measure of the cost of equity capital to Commonwealth Edison. The second measure was based on a 5.8% dividend yield with a payout of 75% and 10% discount for flotation costs and under-

pricing, resulting in 8.6% approximately. Thirdly, on an earnings-net-proceeds basis he suggested a cost of "just under 9%," and concluded with his estimate of cost of equity as 8.75% based on the 3 measures. The resulting over-all cost of capital was established at 5.63%. Professor Bonbright concluded that a reasonable rate of return would be "not less than 6%", and ". . . . that a return of at least 6½% would by no means transgress the bounds of reasonableness during a period of business prosperity if attained by progressive operating economies . . . ."[31]

Appraisal of the "Cost of Capital Techniques"

This brief survey of the various approaches of "cost of capital" witnesses to a determination of the cost of equity capital demonstrates that the problems faced are complex and numerous. One must decide whether he will use the earnings-price ratio, or the dividends-price ratio (or an alternate version, the earnings-net-proceeds ratio); or if both are utilized what weight will be given to each since it is highly unlikely that precisely the same result will be reached. Further one must decide whether the statistics of the applicant utility or those for "comparable" companies will be employed—if the latter, the questions are myriad. The selection of an appropriate historical time period to ensure "representative" market data is a complex statistical problem, since all witnesses deplore the use of spot data as volatile and untrustworthy. Appropriate capital structures, payout-ratios and allowances for cost of flotation and underpricing must be arrived at; and, in at least some proceedings, differential rates of return are allowed for new capital to be raised in the near future. And in the case of Dr. Thatcher, some consideration must

[30] Case No. 41130, Ex. 3.41-42.

[31] *Ibid.*, ex. 3.52.

be given to the ownership group—a problem perhaps more complex than all the others combined. The important point, however, is that many of these issues are not subject to statistical determination, and at every turn involve the use of judgment. As a consequence the alleged major advantage of the cost of capital device is thrown into doubt. This advantage was claimed to be the interjection of *objectivity* in the determination of a reasonable rate of return through reliance on the impersonal market forces, resulting in a precision unparalleled by other methods. However, the reliance upon judgment decisions is so necessary in these studies that objectivity, in the sense of a resulting rate of return which can be proved mathematically correct by reference to market forces or behavior, is almost entirely absent.

One might still argue that even if a "cost of capital" approach to a fair rate of return cannot be derived objectively from market data, the approach is nevertheless sound and provides basic essential background data necessary to a judgment decision on the fair rate of return. Such may be the case, but further examination of the assumptions underlying the method suggest caution if not doubt on this score.

The use of both earnings-price ratios and dividend-price ratios of either the applicant utility or of comparable utilities has serious limitations when held out as proof of the earnings demanded by investors. The theory assumes that the multitude of investors independently judge the risk and income prospects of a particular investment and determine a price for the security in the market place. If this market price is then related to the earnings and/or dividends derived from such an investment, an indication of investor expectation of return or the supply

price of new equity capital is provided. But investors are not buying *realized* earnings or dividends but *expected future income*. Several utility stocks have been selling at 20 times earnings for some time—but this does not indicate that investors are willing to accept a 5% return on their investment. What it suggests is that investors anticipate an improvement in earnings, or dividends, or a capital appreciation through the purchase. The economic conditions peculiar to an enterprise often cast their shadows in advance and are discounted beforehand in the market. While it may be claimed that this objection is one applicable to reliance on spot earnings-price ratios, averaging over a number of years is suggested to correct this. Therefore, some witnesses use "normal" periods such as 1936-46, 1947-52, and a combination of 1939-53 and 1949-53—the use of periods of recession and war, of unprecedented prosperity, and finally the simple use of the last 15 and 5 years in combination. But the averaging process over time may be satisfactory only if the general factors in existence in the past are still appropriate and affect this and other investments to the same relative degree, and if the past ratios are *"normal"* or representative of investor's expectations. But how can one determine whether the past ratios are more normal than those of the present? Only by having a subjective standard of normality which is the very thing that the use of earnings-price and dividends-price ratios allegedly avoids. Furthermore, where recourse is had to the average earnings-price ratios of comparable firms, the "averaging process may do its job too well and factors of long-term significance which will increase or diminish the risk of investment in the particular enterprise may be inadequately evaluated."[32] Thus

[32] Edward Neuner, Jr., "Some Aspects of Federal Regulation of Natural Gas: F.P.C. Rate of Return Policy." Paper before the Western Economic Association, 1953.

the rate of return arrived at will compensate only for the average risk which may be greater or less than necessary to meet the specific risks of the firm in question.

But there may be other shortcomings. As indicated earlier, there is controversy over whether investors are buying earnings or dividends. It is now agreed that the use of earnings-price ratios alone does not recognize the importance of dividends, or the payout ratio, in the determination of the market price. Numerous studies have been presented purporting to show that investors favor stocks with high dividend-payout ratios over stocks with low-payout ratios, ceteris paribus.[33] The assumption that follows is that the higher the payout ratio the lower the cost of equity capital—thus if an analyst wishes to lower the cost of capital he merely has to increase the proportion of earnings paid out as dividends. Such a conclusion overlooks the fact that dividend policy must be determined on the basis of the corporation's capital structure, stability of operations, adequacy of earned surplus, cash position and other factors. Seldom does a witness on cost of capital attempt any analysis of these fundamental factors affecting dividend policy. To suggest that a simple increase in payout reduces the cost of equity capital at best looks at the very short-run situation and, before any validity can be given to the conclusion, requires detailed substantiation.

[33] The boldest of these appears to be that of Mr. Kosh in his testimony before the Calif. P.U.C. Applic'n No. 33952, Exhibit 49, p. 19, and transcript 5094, wherein the witness relates statistically derived earnings/price ratios and payout ratios. The author has added the third column:

Earnings/Price Ratio (close approximations from graph)	Pay-Out Ratio	Cost of Common Equity after 10% adjustment for underpricing, etc.
5.9%	95%	6.55%
6.4%	90%	7.11%
6.78%	85%	7.53%
7.34%	80%	8.15%
7.93%	75%	8.818%
8.6%	70%	9.55%
9.3%	65%	10.33%
10.0%	60%	11.11%
11.0%	55%	12.22%

A weakness of the evidence presented to substantiate the advantage of a high payout ratio is the analysis of the data on only a single year at a time. For example, Clemens[34] studied the relationship of earnings-price ratios and dividend-price ratios for 61 electric companies in 1952. However, by confining his data to a single year, he excludes the possibility that companies with the lower payout ratios provide the investors a substantial market price appreciation and dividend increase over several years, affording a capital return to investors supplemental to that of the initial level of dividends received. Some initial conclusions in another study point to this situation and cast doubt on the utility of the single year data.

If investors in fact do prefer a company with a high payout ratio, despite current high personal income tax rates, such action may overemphasize short-run income considerations. The advantage to be derived from the preferential tax treatment of capital gains should encourage many utility investors to look for capital appreciation through retention of earnings rather than demand larger cash dividends subject to the higher personal income tax. Further, the realization criterion for the capital gains tax enables shareholders to time security sales so as to minimize further their total tax burden. Accordingly, any reduction in the portion of earnings consumed by taxes should reduce the cost of equity capital to the company. (Additionally, insofar as retained earnings would reduce the demand for external equity financing, there would result less downward pressure on the market price of the outstanding securities.) Whereas historical erosion of retained earnings in the electric utility industry might substantiate an investor's

[34] Op. cit., Land Economics, Feb. 1954, pp. 34-36.

inclination to discount retained earnings heavily,[35] at the present time it seems unlikely that such write-offs will occur again (although each utility must be treated on its own merits) and this would suggest that investors would be safe in valuing retained earnings more highly. Clearly if retained earnings are reinvested in property included in the rate base, this addition should enjoy a return equal to that being earned on the equity portion of the investment. The common stockholder would receive his dividend, plus cumulative earnings on that part of earnings not paid out in dividends. The retained earnings will then increase the book value of his stock, augment its earnings, provide higher future dividends, and result in a higher market price.[36] Therefore, where retained earnings are included in the rate base, some capital appreciation should be anticipated. Insofar as this is the case, the insistence on a high payout ratio to reduce the cost of equity capital may be unjustified.

A further deficiency of the cost of capital procedures is revealed when one considers the relation between book value and market value of the common stock. The cost of capital approach seeks to determine a level of earnings which will support a market price sufficiently in excess of the book value of the common stock so that new stock can be sold at a net price equal to or above the book value. In this way the sale of new stock netting book value, will not dilute present stockholders' interests. Witnesses commonly assume 10% as a liberal approxi-

mate discount for the costs of flotation and underpricing, and the appropriate market price then would be 11.11% above book value. But a comparison of such an allowance with the 40% excess of market value over book value which is currently characteristic of the electric utility industry indicates that the earnings on any utility stock so calculated will be substantially below the industry level, and the market price similarly will be depressed.

What constitutes an appropriate excess of market over book is not a simple problem—and among the witnesses reviewed one notices a change in phraseology which may or may not be significant—for some time, the phrase, "a market value *reasonably* in excess of book value", was commonly use.[37] Now the phrase, "a *healthy* excess of market value over book value," or "a substantial excess of market over book," is quite commonly used. There is certainly the suggestion here that "cost of capital" witnesses are beginning to recognize the inadequacy of the 10% adjustment. Clearly, if utility stocks are to average a market value in excess of book value, then in periods of prosperity the excess of market over book value must exceed the average by a considerable margin. While it is not desired to determine here what would be currently a reasonable relationship, the point must be emphasized that any "cost of capital" device does not *objectively* or *otherwise* provide for this requirement since it only provides for an excess of market value over book value which will allow for the costs of financing and underpricing of the new

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[35] During the 10-year period 1941-50 all class A & B electric utilities retained earnings equal to $1.4 billion yet the combined earned surplus increased only about $500 millions. In the post-war period between 1945 and 1952, their combined earned surplus increased $879 millions while retained earnings totaled $1,272 millions.

[36] For a further discussion of this point see B. Graham & D. L. Dodd, *Security Analysis*, 3rd edition (New York: McGraw-Hill, 1951), pp. 500-502, and especially Charles Tatham, Jr., "The Growth Factor in Electric Utility Earnings," *Analyst's Journal*, March 1952, pp. 3-6.

[37] For example see: Dr. J. C. Bonbright, N. Y. Public Service Commission Case 15235, transcript 2036. But compare the later quotation of Mr. Charles Tatham, Jr. in *Analyst's Journal*, November 1953, p. 33. "Similarly, in a recent letter to me, Dr. James C. Bonbright wrote, 'I believe that regulation should encourage soundly managed companies to earn returns that will support a material excess in market values over book values during periods of prosperity'."

stock. Consequently, an extremely important issue in arriving at a rate of return is not adequately met by the "cost of capital" techniques and, if provision is to be made for it, then another judgment factor enters, further destroying the "objectivity" of the "cost of capital" method.

It is sufficient to merely mention another shortcoming of equating a "reasonable rate of return" with the cost of capital. No provision is made for a cushion against bulk increases in operating costs, an item very significant to utilities purchasing natural gas, or large quantities of labor. And, of course, the "regulatory lag" experienced in many states magnifies this additional shortcoming.

Summary

The "cost of capital" approach in various forms to a fair rate of return in utility regulation has received great prominence in the last decade. It allegedly provides a "capital attracting" rate of return and therefore to many of its proponents is synoymous with a fair rate of return. But there is no consensus on the latter point and some witnesses recommend an additional increment not subject to statistical determination.

Sole reliance on the capital attraction standard as developed with the use of earnings-price and dividend-price ratios is inadequate because it assumes that the terms under which a new investor might devote his money to the business represents or limits the return the utility and the present investors are entitled to receive on capital already committed. The return necessary for new capital may be greater or less than a fair return to existing investors.

The historical amounts of earnings realized or dividends paid to common stockholders cannot be accepted as controlling the cost of equity capital. Because of the residual nature of common stock, any method has serious shortcomings which mechanically assumes either that investors are buying past earnings or dividends, or that these past earnings or dividends are the best approximation to future requirements. Further, the assumption that investors are buying dividends only is by no means adequate because there are numerous other possible factors which influence investor appraisals and which are not subject to analysis in a study of dividend-price ratios. Intensive investigation of the motives of investors in utility stocks is yet to be done and unfortunately neither regulatory commissions nor the utility companies are inclined to pursue such an investigation. Detailed information on who owns utility securities (income classification of individuals, type of institutions, the size distribution of holdings, etc.) and the investing habits of the ownership group would cast some light on the motivating factors which induce investment and permit more intelligent analysis of the capital attraction element.

Finally, there appears to be no basis for the claim that the "cost of capital" techniques are based upon impersonal market forces thus affording objectivity and a statistically accurate result. If the witness hews closely to the use of statistically derived earnings-price and dividend-price ratios, the method is mechanistic, but even here judgment decisions are necessary on relevant time periods, payout ratio, capital structure, etc. If the derived statistical data are altered such as by a "normalization" process or if the derived cost of capital is augmented in some way, the result is one of personal opinion. Accordingly, the Commission must weight such testimony on the basis of the witness' intellectual honesty and

demonstrated knowledge of financial and economic matters, as well as other intangible factors. Therefore, there appears to be nothing infallible or sacred about the cost of capital techniques; and as an approach to a reasonable and fair rate of return they have numerous shortcomings in theory and practice.

Mechanics of the Urban Economic Base:
Causes and Effects of Changes in the Base Ratios and the Base Ratio Elements (II)

By RICHARD B. ANDREWS*

Introduction

IT is the principal thesis of this article and the one which follows it in the series that, if the base ratio concept is to become a city planning tool of significance, it must be more completely understood in its dynamic aspects. The immediate practical significance of such understanding would take the form of increased ability on the part of the planner to estimate and control the course of his own urban economy.

In examining this contention the two papers will concentrate on both the known and theoretical effects of base ratio change or, more specifically, on the economic ramifications of changes that may occur in any one of the independent elements of the base ratios. An attempt will be made to relate these element changes to specific causes or cause patterns. A discussion of the causal background of base ratio changes was handled in outline form in the article which preceded this one.[1]

More detailed objectives of the discussion will aim at (1) suggesting to the planner what appear to be the different varieties or patterns of economic interaction that are likely to develop among the elements of the base ratios, and (2) highlighting the numerous deviations from the "rule" of direct proportional reaction of the ratios.

At this stage mention must be made of a criticism that is certain to arise concerning an analysis of base ratio dynamics. It may be said that the cause and effect variables involved in the dynamic phases of base ratio element interaction are so numerous and exhibit so many possible cross reactions that their interpretation and management may well baffle the efforts of the expert base-analyst. If this be true the utility of dynamics analysis to the average city planner is questionable. However, this writer maintains that it is possible to identify broad patterns of change that will be usable by the planner in the social and economic framework of his own community. These papers will sketch the theoretic outlines of those patterns. As mentioned in an earlier paper the approach will be largely *a priori* employing existing facts and appropriate elements of economic theory. Subsequent field testing will quite naturally be required to examine the validity of the hypotheses and suppositions here presented.

Before proceeding with a discussion of base ratio dynamics it is necessary to present definitions of the principal terms to be employed.

The urban economic base itself is made up of those parts of an urban economy which sell or give their goods, services, or capital to persons or organizations whose source of payment or residence lies outside the boundaries of the economic community under analysis.[2]

[1] Richard B. Andrews, "Mechanics of the Urban Economic Base: Causes and Effects of Changes in the Base Ratios and the Base Ratio Elements (I)," *Land Economics*, May 1955.

[2] It is here assumed that even though an organization such as a state or federal research center may "give" rather than sell its services, its economic significance to the community is great in terms of payrolls, local purchases, and the attraction of patrons and complementary establishments whose monetary activities are of signal importance. Moreover, the bulk of economic support of such "free" services does in fact come from outside the community.

Service activities, which constitute the economic complement of the base within a community, sell or give their goods, services, or capital to persons or organizations whose source of payment or residence is within the subject community.

The base ratios which will here be subjected to a dynamic analysis exhibit a general proportional relationship among the elements of base, service, and total employment and total community population. A representative set of ratios appear as follows:[3]

B	:	S	: :	1	:	1
B	:	TE	: :	1	:	2
TE	:	TP	: :	1	:	2
B	:	TP	: :	1	:	4

The method of analysis which will be employed in examining the dynamic relationships of the base ratio elements is relatively simple in its general outlines. Since in the base-service concept of the urban economy the base is considered the strategic factor it is employed as the principal variable in the current analysis. An examination will be made of the base in three general relationship patterns to the other elements of the ratios. First, an analysis will be made of B when it is increasing quantitatively in an employment sense . The essential plan is to determine what influence this change may have, if any, over S, TE, and TP. Base activity will be analysed similarly when it is moving negatively. Finally the analysis will extend to conditions that might develop when no quantitative employment change is occurring in the base, either positive or negative. This last relationship suggests either that the other elements have a degree of independent movement or that the base may be chang-

ing quantitatively in some way not associated with employment, for example, output change.

Since only the quantitative aspects of change in B can be placed on a plus and minus basis, separate consideration must be given to typical qualitative changes that may occur in this element. As the separate arguments proceed the manner in which qualitative changes are likely to modify quantitative conclusions will be introduced.

Effects of Increases in B on Base Ratio Elements

A national or regional upswing in the economy of which the economic base of a particular community is a part is one of the most familiar circumstances in which a particular base is likely to show a quantitative employment gain. It is, of course, understood that a community's base may be made up of many parts some of which will not share in the assumed gain. One may proceed, however, on the assumption of a substantial net gain in total base size.

Base ratio theory assumes that changes in B will lead to changes in the other ratio elements that will in the long run revert to the ratio relationships existing before the change in B took place. A community may exhibit the following base ratio pattern:

	1st Stage (Present)	2nd Stage (Short Run)	3rd Stage (Long Run)
B	1,000 employees	1,200	1,200
S	1,000 employees	1,000	1,200
TE	2,000 employees	2,200	2,400
TP	4,000 persons	4,000–4,200[4]	4,800

If B, as a result of the economic upswing just mentioned, increases from 1,000 in the first stage to 1,200 employees in the second stage, then the ratios are, at least in the short run, in a different relationship than before. However, in the

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[3] These ratios will, of course, vary from community to community. They are, moreover, limited in that they lean heavily on only one economic unit of measure, employment. The symbols have the following meanings: B, base employment; S, service employment; TE = B plus S, or total employment; TP, total community population.

[4] TP is indicated as variable because there is no assurance that the addition to B will bring about, in the short run, an inmigration of population.

third stage, or long run, so the hypothesis runs, the ratios will return to those observed in the first stage, ie., B:S :: 1:1; B:TE :: 1:2; B:TP :: 1:4; TE:TP :: 1:2.

The hypothesis just stated is probably sound as a very broad generalization. An increase in base employment would in all likelihood stimulate activity in S through expanded local purchases on the part of both the added employees in B and the base firms themselves. Cumulatively added employment in S would stimulate more service purchases and hence even more employment in S until the original ratio balance (3rd stage) was approached or reached. TE as the sum of B and S would of course reflect the changes just described. TP would also tend to rise as stimulated activity in both B and S attracted more families to the community.

A good statement of ratio relationships which puts the matter somewhat differently is found in the following quotation:

"We can also conceive of there being some sort of rough balance in an industrial area when the export industries just pay for the imports that the population desires and the output of the residentiary (service)industries is just equal to the demand for it.

"Now, the important question is whether it is by an initial expansion of exports or by an initial growth in residentiary output that this equilibrium is upset and new population is attracted to the city.

"At the outset, it is obvious that unlike the residentiary industries the expansion of exports is not shackled by the requirement that the puny local market absorb their additions to output. The nation and even the world is their market and all they need do is beat out competition in other cities for this vast market. Urban growth can take place so long as the city's export industries are successful in carving out new foreign markets for themselves.

"The new effective demand created by a rise in exports results in an intensified demand for residentiary output and thus for labor (i.e., population) in these industries. An increase in the value of exports causes an increase in the demand for residentiary output of, let us say, 3x (of which x equals the value of imports and 2x the value added locally).

"Not until the value of residentiary output has been augmented by 3x has a new equilibrium point been attained; while any advance past this amount markets a supply for which there is no local demand and which thus disappears.[5]

It is, however, the character and probability of friction within the broad process of element change sympathetic to changes in B with which the planner should be most concerned. The character of these frictions or deviations can take many familiar forms. Whereas B may increase it can not always be assumed that S and TP will follow suit. The increase in B may be drawn from the local labor market in the form of unemployed persons or persons not formerly employed who are attracted by the new job offerings in the community. A reaction to changes in B of this type may have no direct influence over TP. In this situation it might still be possible that S would show the increase expected of it but, as with B, additions to staff or additions to the total number of S firms might be drawn from the local population. A compromise situation is also possible in which employment additions to B would absorb all surplus labor and thus cause employment expansion in S to be dependent on inmigrating employees. Expansion in the number of firms in the S category would be likely as a result of rising profit margins in the existing firms. A qualifying factor bearing on this situation would be that in which mobility of labor to the community in question was inhibited due to forces of wage competition or negative factors in the bidding

[5] Robert L. Steiner, Discussion on papers by Dr. Phillip Neff and Dr. Rutledge Vining, Papers and Proceedings of 61st Annual Meeting of the American Economic Association December 1948, *The American Economic Review*, May 1949, pp. 131-132.

community such as a shortage of housing, high living expense, and shortages of capital for plant expansion and short-term credit. If such a situation did occur then neither S nor TP might show immediate growth sympathetic to the positive change in B. Duration of second stage dislocations would depend on the rate at which these inhibitive factors disappeared.

The tendency for S to lag behind increases in B and for TP to share prominently in the lag is rather well expressed by McLaughlin when he describes reactions to a step-up in coal mining:

"Workers from other pursuits do not appear to have been attracted into the mining industry immediately upon report of its growth . . . . men were likely to wait until the possibility of employment in mining seemed reasonably permanent. Moreover, population growth has lagged behind the expansion of mining operations, partly because the development of related industries has been delayed. Various service industries as well as local industries consuming coal have not appeared until coal mining was of some importance."[6]

There is yet another situation in which S might be expected to remain stationary while B is changing. This may occur as a result of the spending propensities of those added to the active labor force of the base. If there was a tendency for the employees added to B to save heavily or to spend at establishments outside the community then S would not be as likely to respond positively. Resistance of S to an employment increase sympathetic to that of B is also encountered in situations where S is producing goods and services at less than maximum capacity. Many businesses are able to absorb a respectable addition to their dollar trade without

making additions to staff. Increase in the intensity of use of the labor force can also assume the form of overtime. It is even possible that substantial additions to plant might be made without additions of personnel in S particularly in those cases where a higher degree of mechanization is introduced.

A further deviation from the general assumption of element interaction which is expected when an increase in B takes place is the overcompensation of S. This clearly differs from the other deviations described thus far which have almost uniformly represented some form of resistance to change in step with B. Specifically, there sometimes seems to be a tendency for S not only to increase quantitatively along with B but to do so to a degree heavier than would ordinarily be expected. If B rose from a first-stage level of 1,000 to 1,200 in the second stage S, in a ratio of 1:1 with B, might be expected to move from 1,000 in the first stage to 1,500 in the latter part of the second stage then down to 1,200 in the long-run third stage. Thus S follows the general theory of interaction and final adjustment with the quirk of overcompensation in the second stage rather than consistent undercompensation up until the equilibrium point of the third stage when the original ratio of stage one is reestablished. The circumstances in which this situation develops are relatively familiar. In a community where B is expanding rapidly and where the limits of its expansion are not definitely known S may tend to staff heavily and new firms in the S category may open. It is expected, of course, that competition among the over-supply of outlets in S or among the overstaffed existing enterprises will become so sharp that profits will tend to shrink and S will begin to contract until it is in third-stage ratio balance with B. Of course, if B continues to expand, the

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[6] Glenn E. McLaughlin, *Growth of American Manufacturing Areas* (Pittsburgh: University of Pittsburgh, 1938), p. 271. Here is suggested, in addition, the concept of cumulative growth within B as associated industries, also of a basic character, are attracted to a community area by coal mining.

initial overcompensation of S may be erased without shrinkage in employment or firms.

There is no probability that with an increase in the base S or TP would decline. Only a possibility of this situation exists and a remote one at that. Negative movements could occur if a qualitative change in the base were taking place at the same time as the quantitative shift. Rapid transition of a community economy from tourist-recreation industry to an army installation might cause a radical alteration in the nature of S, possibly reducing the range of service activities rendered. If the reaction of S were sufficiently strong it might more than counterbalance the rise in B and thus cause a decline in TE and TP.

One special situation does exist, however, in which S is rather certain to decline with a rise in B. During defense production periods, particularly in time of war, S may be cut back substantially as a result of rationing and difficulties in getting personnel in competition with defense production. This situation differs, of course, from the others which have been described thus far in the fact that it is a short-run phase partly outside the framework of the free market. It is, moreover, a condition which is for the planner far more predictable and controllable than the others.

To summarize, it may be said that deviations from the broad hypothesis of base ratio element interactions under conditions of change in B are of two kinds. One type of friction is evidenced by a prolongation of the second stage beyond what might be considered a normal adjustment period. The other type of deviation is one in which the quantitative change in B is paralleled by a qualitative change which leads to an entirely new set of base ratios for the community in the long run.

The reader has perhaps noted that separate mention and discussion of TE has been sparing. This is due to the fact that TE is the sum of B and S. Consequently, changes which influence these two ratio elements need merely be summed to determine the effect on total employment in the community.

As mentioned in the introductory section of this paper, one is impressed with the number of variables involved where base ratio dynamics are concerned. However, a beginning can be made as was done here by assuming one type of change in the strategic ratio element (B) and then tracing down the varieties of variation that may evolve from the change in the other elements. Nonetheless a substantial question remains as to how an individual planner will be able to determine which situation or combination of variables will pertain in his case. While there is no easy answer to this question the general outlines of it may take the following form. The planner in order to anticipate the nature of ratio-element reactions must be intimately familiar with not only the markets, raw materials, and productive factors of B and S but must also know the degree to which local plant and labor force are being employed in relation to the limits of their current productivity. Relative to the labor force he should also know in general the degree to which it is expandable from within the local population. He has some data background for estimates on this score from experience of the war years. With these essential data at hand, plus an understanding of the expenditure habits of the people of his city, the planner should be able, with fair accuracy, to predict the ways in which the other ratio elements will react to an upward shift in B. Qualitative changes

that take place with an upward quantitative shift are much more difficult to define and manage. As might be expected, a great deal will depend upon the character of the qualitative change. The planner will have the all important social and economic data on his community with which to make his estimate in this situation. However, if the qualitative change in B is new to his community he must rely on data from other communities in which a similar qualitative change has taken place or in which industrial activity of the type in question is dominant.

Effects of Decreases in B on Base Ratio Elements

According to the general hypothesis of base ratio interaction a decline in B is expected to bring about a chain reaction similar to that described for increases in B—only, of course, in reverse. Hoyt describes the economic process of decline in his Brockton Study:

"This loss of basic jobs (in shoe production) will gradually bring about a continued shrinkage in service employment . . . . The Main Street merchants would suffer because retail sales in the entire Brockton area would drop. . . . New construction will come to a standstill . . . . many will be forced to vacate their existing homes or double up with relatives . . . . Essential medical and dental services will be neglected and doctors and dentists will have lower incomes . . . . Most people will have little left for saving. The expenses of local government cannot be reduced . . . . The tax burden will bear heavier on the citizens with lower incomes.

In time this continued unemployment in the Brockton area will force a migration of the surplus labor elsewhere so that the Brockton area would normally suffer a de-decline of 10 per cent or more in its population."[7]

A sort of cumulative regression takes place in this situation which contrasts

[7] Homer Hoyt, *A Report on the Economic Base of the Brockton, Massachusetts Area* (Brockton, Massachusetts: January 1949) p. 35.

with cumulative progression of S that occurs when B is advancing. Cumulative regression has reference to the fact that as some establishments in S experience a falloff in business discharges of employees will naturally occur. Discharged employees of S like those of B will reduce their trade with establishments of S thus leading to further cuts in staff and firm closings in the service category. It is assumed that whatever patronage of S by B as a producer exists within the community has already been discounted from the business volume of S to the extent of the decline in B.

In this same reference Hoyt also observes that a decline in B will have what may be called "selective" effects on S. He says that the drop in sales would be particularly sharp "in clothing stores, furniture stores, and drug stores."

There might be added to the list of those portions of S that would be negatively affected at an early date by a decline in B, home appliances, automobile sales establishments, building construction and other varieties of consumer and local producer durable goods activities.

Possible counter-effects in a positive sense might be encountered in such S activities as gasoline and oil sales in connection with job searches, tavern and even movie patronage.

It is likely that certain "core" elements of S would resist the economic attrition resulting from a decline in B. Establishments marketing consumer necessities in the non-durable line such as utilities, heating fuel, and groceries would not be immediately affected to any great degree by this belt-tightening which would begin to operate in the later phases of stage two. Extension of credit by firms such as these would maintain their book volume of business. However, the core of S would also begin to show signs of

significant employment decline and increase in firm closings when actual outmigrations of the labor surplus from B and non-core portions of S began to take place.

There is a strong likelihood that the tendency of S to overcompensate on the upswing of B will not be present in reverse form as B declines. This conclusion, based on observation of scattered data, seems to indicate that S seems more stable or resistant to change in this negative phase of a community economy and moves down more smoothly into the third stage. The reason for this condition may be found partly in the fact that unemployment compensation and accumulated savings, while they will mean consumer expenditures at a lower level than under regular wage payments, will provide a sort of economic tapering-off device. In addition there is the tendency for the firm to protect its investment as long as possible rather than to respond quickly and in excess to reduced patronage by numerous closings. One might also say that the factor of American optimism in matters of business has a stabilizing effect in this situation.

The discussion up to this point has been concerned with the detail of the general hypothesis of ratio element interaction on a downswing of B and has not analyzed the nature of deviations from this hypothesis.

Earlier discussion in this section of the paper has indicated that S may for a time remain unchanged in the second stage but will slowly react negatively, as B declines, into the third stage. Apparently, the only way in which S can permanently resist entry into the third stage is by a qualitative change in B as it declines quantitatively. There might occur, for example, a qualitative shift in the base from raw materials processing at a low wage rate to marketing activities at a relatively high rate. Although the total of employment in B might drop sharply the total of wage payments from B might remain the same. In this situation there is a strong chance that S might, therefore, remain unchanged. Naturally, there would be limits to the extent that employment in S would be uninfluenced in this situation because for many enterprises the number of family patrons is a factor of great importance. Moreover, as the volume of employees fell, total wage payments within the community remaining the same, the proportion of the wage total entering into savings would increase, thus diminishing consumption payments to S. Despite the obvious limitations of this line of reasoning it should be pointed out that the type of qualitative change in B just described could also lead to a *positive* shift in S if the contrast in the local economies before and after were sufficiently dramatic. But a condition of this sort would certainly be highly unusual.

Before concluding comment on S in relation to its reaction to negative employment shifts in B it is appropriate to emphasize the role of long-term, even permanent, relief payments. In an economic sense relief payments actually represent part of the base of a community during the time that they are operative and therefore represent a qualitative change in B. They do not, of course, represent a complete substitute for the wages that the family is no longer earning and to the extent of that difference represent a loss to S. As was mentioned at an earlier point unemployment compensation and relief payments made in a community where B is in decline are a means of delaying the arrival of the third ratio stage by maintaining employment in the core establishments of S. However, in all American communities unemployment compensation on an indi-

vidual basis has a definite termination date. Direct relief payments and even local work relief in this country are assumed to be largely temporary expedients for the individual family when applied to a particular community or region. However, in countries where the dole system is used to care, on a rather permanent basis, for the needs of the population of depressed areas S may never enter the third ratio stage since the dole payments have become a relatively fixed part of B. For the local planner a situation of this variety would probably be so familiar in terms of its economic effects that no lengthy analysis would be required to determine the significance of its presence. Mention of it is included here only for the sake of giving better rounding and definitiveness to the discussion.

The balance of this section on negative shifts in B will be concerned with effects on TP. Some of these effects have already been suggested but here will be handled more explicitly.

According to the general assumption of automatic ratio adjustment through a three-stage process TP will decline sympathetically as a drop in B occurs. This assumption or hypothesis is reasonable in that a fall in employment within B may lead to cumulative discharges throughout S as has been demonstrated earlier. Since unemployment is not considered a desirable way of life by most people it is likely that out-migrations of these surplus unemployed will take place and that TP in the third stage will resume its original ratio level of stage one before the decline in B began.

Deviations from this assumption are, on the whole, more familiar to economists than many of the others which have been discussed thus far. Consequently, relatively brief treatment will be devoted to the ideas involved.

The relatively automatic negative adjustment of TP which is implied on a decline in B is founded on the assumption of mobility of productive factors, particularly labor.

As Hoover has pointed out, "the usual hindrances to migration are all too familiar." In this connection he identifies two types of "perversities" that complicate the response of labor supply to geographical differences in labor demand.[9] One of these perversities is the simple fact that as the cash resources of the unemployed family decline their ability to move is either impaired or eliminated. The second perversity is the high birth rate of the lower-income groups. This situation represents a further cash drain on these families but in a more important sense a high birth rate means a constant heavy supplementing of the local labor supply.

An expansion of this line of thought is to be found in a report of the Detroit City Plan Commission which points out that:

"The employment level at which out-migration reaches a considerable volume will be affected by such factors as the level of incomes, unemployment compensation, public assistance policy, job seniority provisions, and economic conditions in other areas."[10]

Simple lack of information on the part of the unemployed concerning job openings in other areas, sentimental ties, social attachments, and home ownership can also be identified as frictions impairing the free flow of labor and population among communities and economic regions. Combination of factors similar to those just listed in part explain the otherwise paradoxical fact that entire industrially depressed areas such as those found a few years back in New England

[9] Edgar M. Hoover, *The Location of Economic Activity* (New York: McGraw-Hill Book Company, 1948), p. 107.

[9] *Ibid.*

[10] Detroit City Plan Commission, *Economic Base of Detroit*, (Detroit, Michigan: 1944), p. 22.

have witnessed but little decline of TP.[11]

Similar observations were made by McLaughlin in describing the reluctance of a mining population to leave old mining districts where output was declining. Reluctance of this variety may include a generous portion of human inertia to change particularly if change may involve a shift in type of employment as well as area.[12]

Friction in yet another form is associated with that part of an urban labor force which has recently migrated from agricultural areas. During periods of unemployment this group is likely to show inertia because of a reluctance to return to rural living combined with an ignorance of other urban areas.[13]

It has been rather taken for granted in this entire discussion of labor mobility that urban base area TP would in time of national depression be relatively stable. Little alternative opportunity would be available in other areas for the bulk of the unemployed. Net out-migrations to rural areas during the depth of the depression did, of course, influence the population totals of many American cities somewhat.

There is, undoubtedly, a close relationship between the immobility of capital (plant) and the relative immobility of labor when B declines. Where plant investment is very large and relatively immobile, as is the case in mining, there is some tendency for the labor force to be "infected" by this immobility. Unemployed labor seems loathe to move as long as the works remain and there is even a remote chance that they will resume production. Immobility of some of the heavier forms of capital equipment is emphasized by Hoover when he reminds

us that such equipment is highly specialized having no or few alternative uses in the same area.[14]

By way of qualification of the above statement it must be pointed out that when a firm has branch plants outside the base area and when these plants have job vacancies it is, of course, possible to shift at least a part of the discharged force from the plant in the area of declining activity to the branch.[15] Undoubtedly certain types of capital equipment would also be more mobile in these circumstances.

By way of summary up to this point it can be said that most of the frictions and perversities that have been mentioned merely tend to delay the arrival of the third stage or prolong the second stage in which the base ratio elements deviate from their original, first-stage relationship. Only in relatively special circumstances such as those mentioned in connection with New England and the depressed areas of England would TP rather permanently resist full-scale change to stage three. Recognition of the individual community pattern of frictions by a local planner can give him a firmer basis of understanding of what to expect of the ratios when B is declining.

A separate aspect of this specific question of the nature of local developments when B declines is connected with consideration of the tendency for replacements in B to be attracted to the community before TP or S have shown a material decline toward stage three. Here is involved consideration of mobility of factors of production *into* rather than out of the area. Involved, also, is an examination of the extent to which a decline in B may be self-curative in that the local supply and price of factors becomes so attractive in competition with

[11] *The Nation* (a letter), May 27, 1950, p. 536.
[12] McLaughlin, *op. cit.*, p. 271.
[13] Detroit City Plan Commission, *op. cit.*, p. 20.

[14] Hoover, *op. cit.*, p. 149.
[15] *Ibid.*, p. 151.

other areas that economic regional readjustments are likely to occur.

Frictions affecting free inflow of productive factors to a community, with B declining, roughly parallel some of those discussed in connection with the situation surrounding out-movement. For example, relative immobility of capital equipment, cost of moving, difficulties of short-term finance in the depressed area may all work to the detriment of self-adjustment of B.

The attractiveness of communities in which B is depressed is not enhanced by difficulties and costs of plant conversions to suit the needs of substitute industries. Attrition of the tax base may have resulted in higher tax rates, while public services may have declined in quality. At the same time selective migration may have drained away the handful of key technical personnel so important to efficient production.[16]

It must not be concluded from the foregoing discussion that no in-movement of productive factors takes place when there is a local base decline. The intent was only to show the obstacles to free and automatic in-movement. Again it is the local planner's task to determine what the probable obstacles are and how they are likely to operate in his own community. Hoyt's analysis of the situation in Brockton was most interesting in this connection when he said:

"Idle labor seeking jobs, and empty factories (shoe), will attract garment and textile manufacturers and also some iron and steel and machinery firms, so that 1,000 of the 3,525 unemployed would probably be absorbed. Moreover, 500 more will find employment in Boston or other cities outside the Brockton area . . . ."[17]

The last sentence is descriptive of a type of qualitative change in B which

[16] *Ibid.*, p. 199.
[17] Homer Hoyt, *op. cit.*, p. 35.

develops as a small part of the Brockton labor force moves from former shoe production jobs to commuting. This type of compensation where a decline in one part of B is partly made up by an increase in another is usually available only in metropolitan areas where the subject community is one of the smaller population units, or where the community is so large and its base similarly so large and diversified that employment losses in one part of B can be absorbed by other parts. If absorption potential is high probably no change in S and TP need be anticipated. This situation suggests the importance in estimating patterns of ratio change of considering not only the number of predominantly basic firms but also their employment size and industrial type distribution within an urban base area.

Hoyt brings out another unique aspect of this type of compensation which contributes to stability of TP in a satellite community. He shows that as the out-migration of surplus shoe workers begins to take place housing vacancies begin to appear and rents and sales prices fall. At that time there was an acute housing shortage in Boston. Consequently, the vacant units were absorbed briskly by Boston employed families and Brockton's TP ratio element was maintained at very nearly first-stage strength as B via new commuter-volume was supplemented.

While on the subject of qualitative change it is appropriate to inquire if there are any circumstances in which TP would rise with a decline in B. In this writer's opinion a situation of the sort could develop only in the event that a qualitative change took place in the deflated base which caused S to expand by more than the loss sustained by B. In these circumstances TE would increase and TP would be likely to follow. This idea might be stated in somewhat

different form by pointing out that B when measured in terms of employment might very well decline in a community while S and TP were rising as a result of the development of a heavy retirement population. Here, of course, retirement families would actually be the equivalent of base workers but in the narrow measurement concept of the ratios would not be counted as "employees."

General Observations on Quantitative Changes in B

In concluding this discussion of the processes and effects of change in B within an urban base area some comment is appropriate on the more general questions of dynamics that are involved whether the employment size of B is rising or falling.

One of the general problems alluded to earlier in this article relates to the estimate of time between stages two and three. Clearly, the degree and strength of frictions and perversities encountered in a particular urban area will determine mobility of factors both inward and outward and hence the speed of movement from stage two to three. The longer the period of adjustment between stages on the decline the greater are the chances that the urban area will enter a "depressed" classification with a considerable element of its population economically stranded. Similarly on a base upswing the lengthening of the adjustment period between the second and third stages can mean a possible impairment of base expansion in that S, by not keeping pace, will stimulate labor turnover and waken the power of the base to attract competent skills. Insofar as the actual time period involved is concerned as between stage one and three not much formal evidence is available. However, McLaughlin claims that in mining communities of Pennsylvania population changes appear to have lagged about three years behind downward changes in coal output.[18]

There is no doubt that the speed of transition from stage one to stage three in a negative situation will be greatly affected by such a factor as local finance policy as it relates to both construction and inventories. If financing has been relatively careless and conventional safety margins have been disregarded, sudden tightening of policies on a decline in B may lead to an acceleration of firm failures through foreclosure or slowdowns of operations in S greater than might normally be expected when B declines. Much may also depend on the maturity of firms involved in a particular community case or the number of firms found in S. If a heavy majority of the firms in S are mature and well established the rate of stage-to-stage retrenchment will be gradual. If, however, the number of young and marginal firms is high in the S portion of the city economy deflation to stage three may be rapid. Number of firms embraced by S may also influence rate of reactions. It is likely that the greater the number of firms the slower the reaction will be and vice versa.

Another factor which is likely to influence the rate or speed of ratio element shift through the stages of adjustment centers around the direct business relations of B with S. In any community B in its productive processes is likely to draw on S for such familiar items as power, transport and the like. However, in certain situations the pull of B on S may be far stronger than the average for, let us say, food, office supplies, and many other typically local merchandise products and personal services. In cases such as this, increases (or decreases) in base activity are likely to cause S to be far more sensitive than it might otherwise be

[18] McLaughlin, *op. cit.*, p. 265.

and, therefore, to make it move more quickly in the direction that B is assuming.[19]

A number of questions exist relative to the anticipated actions of the ratio elements, particularly B, which have so little formal data surrounding them that they cannot even be said to be parts of a hypothesis of the ratios. Nonetheless they are worth stating in outline form in the hope that they can ultimately be fitted into a more coherent line of reasoning.

There is, for example, the question concerning critical points in size changes of B, positive or negative. Before the ratio elements in stage two can begin a shift into stage three the change in B must be of a sufficient size (or kind?) to incite changes in the other elements. Can a general rule be determined for these critical points or must conditions be determined from case to case?[20]

Associated with the question of critical points is the somewhat more manageable question concerning the degree of plus or minus change in a portion of B that must take place before associated industries, also mainly of the base, are either attracted to or repelled from the urban base area. The work of Isard and Whitney is of particular value in suggesting the nature of developments in this direction.[21] This type of change in B points to cumulative patterns of development within that element which are related to the question of linkage that will be commented on more fully in the next article.

Another bothersome question which is quite completely in the realm of the unknown is that concerning the character of the influence of the mix of B and S activity in the firms of a given community over the interaction of the ratio elements. If the firms of a community were pure types; that is, entirely associated either with the base or the service portion of the urban economy, the problem of estimating the dynamics of interaction of B with the other elements of the ratios would be simplified. However, most firms are typically mixed and, of course, vary in the degree of B and S activity in their total business makeup. As community size increases it is probable that the proportion of S in the activity of many firms also increases until S possibly dominates that firm's business. If B activity declines in a firm without a corresponding rise in the S portion the degree of mix with S may determine whether that firm moves from the area or goes out of business. Similarly, on the upswing the degree of S (or B) activity in the firm's business may determine how far expansion of plant and employment is feasible if S (or B) activity is looked upon as an "insurance" factor.[22]

(*The next and final article in this subseries will concentrate on that aspect of base dynamics concerned with the potentialities for independent change in ratio elements S and TP. Attention will also be devoted to the position of linkage and the input-output concept in the dynamics discussion.*)

[19] This line of reasoning may also indicate that the degree of flexibility in the expansion potential of B is related in some urban areas to close productive factor and materials relations with S.

[20] Robert Gold, *Manufacturing Structure and Pattern of the South Bend-Mishawaka Area* (Chicago: The University of Chicago, Department of Geography, 1954).

[21] W. Isard and V. Whitney, "Atomic Power and Regional Development," *Bulletin of the Atomic Scientists*, April 1952, p. 122.

[22] A very clear and well presented statement of the nature of mix is to be found in an article by John W. Alexander, "The Basic-Nonbasic Concept of Urban Economic Functions," *Economic Geography*, July 1954, pp. 253-255.

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Housing Data Obtained by Sampling Public Records[†]

By SHERMAN J. MAISEL[*]

The Need for Statistical Data

MOST observers who have attempted to analyze the housing problem, work on particular housing markets, or deal with problems in real estate finance have been concerned with the lack of adequate data in the field. While there have been periodic attempts to fill these gaps, complete and reliable data on financing, market activity, or price changes are not available. One might go further and say that the number of useful methodological studies leading to a basic knowledge of how such data might be gathered have been few.

This article reports a research project designed to examine one possible method of obtaining such needed data. In addition it includes considerable new information on the workings of the housing market. A re-examination of previous studies in the light of modern statistical techniques indicated that by drawing a semi-permanent sample of properties and obtaining data concerning them from the public land records, much of the required information could be obtained without bias, inexpensively, and efficiently.

Some indication of the magnitude of the problems created by the shortcomings of the price and financing information presently made available by the nation's statistical system can be obtained from an examination of the debate and public concern over the possibility that present federal policies may be causing too great

a concentration of construction demand in a short period, that on the whole they have tended to be inflationary, and that they have not really aided house buyers.[1] Charges have been made that while the federal government has spent, insured, or guaranteed over $60 billion of purchases in the residential dwelling market, the commitment has not served its specified purpose under the National Housing Policy of improving the standard of housing while reducing its cost.[2]

Many of the charges and counter-charges in this debate seem to be hypotheses which exist in a form suitable for analysis by statistical data. These programs have been established to affect costs and prices. It is probable that they have done so. Has their effect been good or bad? Is it true that the Federal Housing Administration (FHA) and the Veterans Administration (VA) have, for primarily administrative reasons, concentrated credit in the market for new or recently constructed houses with a consequent undue expansion and price rise for these units? Have these agencies accelerated the trend to the outskirts and increased the blight in the center of the city as a result of differential terms highly favorable to the new areas?

To test the effect of the programs and actually to administer them as required by the laws, one must have current information as to the amount and sources of lending. It must be possible to classify loans by type of house, age of house, and area. In addition, there must be data on prices and costs and changes in these

[1] *Congressional Record*, U. S. 84th Congress, 1st Session, pp. 1807-08.

[2] Public Law 171, U. S. 81st Congress, 1st Session, Sec. 2.

factors as related to financing and income.[3]

The contrast between the data available on the housing market and that required for sound decisions makes clear the statistical gaps in the field. The government's statistical program contains three primary sources of data, all concerned with financing. There is no information on prices or actual costs: (a) The Home Loan Bank Board estimates the number and amount of non-farm mortgages under $20,000 recorded by different types of originating agencies. (b) The Home Loan Bank Board also estimates the total amount of mortgage debt outstanding by type of lender. Some of these estimates are based on recordings and some come from the balance sheets of lending institutions. (c) The VA and FHA issue monthly aggregates of the amount and number of loans made and outstanding. In addition, the FHA annually publishes a study of the type of loans the agency insured by borrowers and by type of property in the previous year.

The present program then can be summarized as presenting aggregate information with an unknown estimating error of the mortgage loans made and outstanding on an undefined hybrid of properties which may include lots, commercial properties, factories, farms, and houses. There is no indication of the type of properties on which loans were made—whether new or existing, by location, by size, or by age. It is not known whether the loans are for temporary construction purposes, for purchasing of properties, or for refinancing. There is no way of telling whether the mortgages are senior or junior liens, or what is the volume of repayments or reconveyances. Most important, there is no knowledge of major market and economic influences such as down payments, incomes, or prices.

In addition, in the past the government has made certain studies of a broader nature. Most important was the *Census of Housing: 1950, Vol. IV, Residential Financing*. This showed for the census date much information concerning the outstanding debt and properties on which it was based.

During 1949-1951 the Bureau of Labor Statistics also gathered rather complete data on the type and buyer's characteristics of new houses erected in a selected group of metropolitan areas. An examination of these two sources gives an indication of the type of data needed. The contrast between them and the current data shows how poor the latter are for most analytical purposes.

There are, of course, many other needs for price, market, and lending data. Houses have a major weight in the B.L.S. Consumer's Price Index, yet to date no estimates for this item have been published. The housing sector of the National Income Account is said to have the lowest reliability of all.[4]

More important still is the problem of local markets; for it is in each locality that the housing problem actually exists. Here is where prices are made and programs are administered. An example of the magnitude of these problems for a local area is shown by the fact that in a single section of one city—Philadelphia—it has been estimated that over $180,000,000 of government funds or insurance and guarantees will be needed to redevelop and rehabilitate existing housing.[5]

[3] For an excellent statement of some of the problems as well as a marshalling of most available data, see Leo Grebler, *The Role of Federal Credit Aids in Residential Construction* (New York: National Bureau of Economic Research, Occasional Paper 39. 1953).

[4] United States Department of Commerce, *National Income*, 1954, pp. 46, 63.

[5] Institute for Urban Studies, University of Pennsylvania, *Program for Eastwick Housing Market Development Analysis* (Philadelphia: 1954), p. 1.

A Program To Develop Required Data

Obviously, simple reiteration of the need for better statistics in a field is not too useful for complaints alone may get no more action than they have thus far for housing data. The object of this article, therefore, is not simply to complain about obvious neglect but to suggest one possible method of solving this problem through the use of modern statistical techniques. At the same time it reports the results of a pilot study conducted in one area so as to give an indication of the costs involved, some of the difficulties encountered, and the type of results which can be expected.

The method suggested is: (1) to draw a permanent stratified sample of all residential housing in the United States (or all types of properties if a wider goal is desired); (2) to keep this sample up to date by the use of building records; (3) to enumerate information as to sales, prices and lending activity for this sample by use of public deed and mortgage records; and (4) to enumerate additional information concerning purchasers' and borrowers' characteristics if desired by telephone or personal interview in those units for which activity is indicated in the records.

While this program differs considerably from those used previously in the housing field, it uses standard sample survey techniques with two exceptions: (a) Potential respondents are pre-screened by use of the public records. This can serve to cut the number of necessary calls by 80 percent or more. (b) Much or all of the information desired is enumerated from the public records. This increases its accuracy and at the same time greatly reduces the costs of enumeration.

This sampling procedure was developed as the result of a careful analysis of the many approaches which have been used or suggested as a source of current housing data.[6] These studies indicated the great advantages obtained by using official records. Since the records are open, and usually centralized, they are comparatively inexpensive to use. Because they are official and written, they avoid the large errors in enumeration which are encountered if questions concerning financing are asked of the average housewife.[7]

It appeared upon further analysis, however, that the methods used in the past were not as efficient as possible and that these defects in their design may have led to their disrepute. An obvious requirement of any sound statistical procedure in this sphere would seem to be that the data either be completely enumerated or that it be sampled on a probability basis so that a sampling error can be specified for the results. Many of the methods suggested in the past have failed because they dealt with unknown proportions of unknown universes. This occurs, for example, when newspaper advertisements or reports of selected real estate dealers are used as a measure of all sales.

In the more common case, however, the problem is more subtle. A sampling error can be specified, but it does not refer to the universe concerning which analysis is required. This problem arises when a sample of all deeds and mortgages

[6] R. M. Williams, "An Index of Asking Prices for Single Family Homes," *The Appraisal Journal*, January 1954; E. M. Fisher, *Urban Real Estate Markets: Characteristics and Financing* (New York: National Bureau of Economic Research, 1951), Chs. 3, 4, and App. A; L. Grebler, *Housing Market Behavior in a Declining Area* (New York: Columbia University Press, 1952), Ch. VI and App. G.; R. L. Tontz, J. Kristensen and C. C. Cable, Jr., "Reliability of Deed Samples as Indicators of Land Market Activity," *Land Economics*, February 1954.

[7] For an excellent discussion of the methods, advantages, and problems encountered in the use of public records cf. Illinois Tax Commission, "Tax Rate Limits and Assessment Ratio 1925-1940," *Survey of Local Finance in Illinois*, Vol. VIII, (State of Illinois: 1940). For a discussion of errors in response, cf. U. S. Bureau of the Census, *U. S. Census of Housing: 1950. Vol. IV, Residential Financing* (Washington, D. C.: Government Printing Office, 1952), pp. xv-xvii.

are drawn; for the reason that they contain no information as to the property characteristics but only the property's address. Thus while a sample of this type gives an estimate of the number of deeds and mortgages, it gives no information concerning the relationship between these facts and the land or the types of buildings to which the information pertains. As a result, as for example in the Home Loan Bank Board's data on recordings, what is obtained is a conglomerate index based on vacant land, residential properties, commercial and industrial buildings and others. This problem was solved in the procedures developed in surveys for the Federal Reserve Board and the Home Finance Agency in 1951 and 1950 by National Analysts Inc. and the Survey Research Center, respectively.[8] In these cases, a sample was drawn from the deed recordings which was then related to the underlying unit by a personal interview with the owner.

This method allows one to specify complete details concerning units transferred in the market in a given period. It does not allow one to describe the complete housing stock since units sold are known to be a biased representation of the entire universe. In addition, calling on the owner of each property shown on a deed is expensive since many will not be in the universe about which data are desired.

The method suggested for this study appears to meet most of these difficulties. It uses as the initial population not the deed or mortgage recordings but the actual properties in the area. A sample of all the individual lots is drawn. It is kept current by use of building records. The characteristics of each lot and any developments on it are obtained. The sample can thus be classified by type of

[8] For complete details see, "Home Purchases in the Five Months Following the Introduction of Real Estate Credit Regulations," *Federal Reserve Bulletin*, July 1951.

property and any further efforts can be concentrated on the classification desired. The further enumeration of current data comes from the public records and if more information is desired from the property owner.

The use of a classified sample of properties rather than of deed recordings retains the advantages of enumeration through the public records and has the following additional advantages in comparison to those previously discussed.

1. It relates deeds and mortgages directly to the types of property underlying them. In addition, since the sample is unbiased in terms of the complete population of properties, results can be discussed either in terms of all units which is what is usually desired or in terms of all units sold or mortgaged (which is all that is available if recordings are used as the population).

2. The knowledge of the underlying property means that it is not necessary to include in the sample for enumeration deeds or mortgages on types of property not in the desired universe. In addition, since deeds and mortgages frequently accompany each other, fewer final calls need be made since both can be handled together. It is unlikely that in a sample drawn from the deeds and mortgages many would be on the same property unless the sample were very large.

3. Finally, it increases the amount of useable information that can be obtained from the public records alone and also serves to lower considerably the sampling error for many items. The additional information is available because in examining a deed or mortgage without knowledge of what liens already exist on the property, it is impossible to know whether the deed indicates full value or only the equity, whether the mortgages are senior or junior ones or in the cases of reconveyances, to which mortgages they refer. As a result, unless data over time are available for a property, this information must be obtained in a personal interview. The sampling error is reduced with respect to attributes because the longer a property is observed the more likely it is that a given attribute will appear. As a result P and Q more nearly equal each other and thus without increasing the number of observations the

sampling error becomes a smaller proportion of the desired figure.

Procedures and Costs Involved in Selection of Sample and Enumeration

The selection of the sample of houses for this pilot study was done in two stages. The first consisted of drawing a sample from the universe of all lots in the County of San Francisco. In the second, information was obtained to classify the properties and to determine which fell in selected universes based on property types.

The sampling plan was that of a stratified probability sample of approximately one percent. Stratification was designed to take into account variances in both type of structure and prices of houses. The assessor's maps of San Francisco contain approximately 148,000 separate lots grouped into blocks. Sampling units were obtained by drawing the desired number at random from a district of several blocks. Each district was in one of six strata and the sampling proportion differed in accordance with the estimated variance of each stratum.

Characteristics such as vacant or improved and type of building, and also information as to size, number of rooms, and year built, were obtained for each lot drawn in the sample. It was not necessary to visit each sample lot to obtain this information. The basic land use was shown on current Sanborn maps. Characteristics of most improvements were available in a very complete file maintained up to date by the County Assessor. (We are indebted to the assessor, Russell L. Wolden, for permission to use these files which saved many man-hours.) Only a small percentage of lots had to be visited in person to obtain data. (This problem of drawing a sample and obtaining the characteristics of structures would be even simpler for a federal agency since the census has a complete listing of all dwelling units as of the census date and a proper sample with information as to characteristics could be drawn from the census data. I am indebted to Ramsey Wood of the Federal Reserve for pointing this out to me.)

The San Francisco sample was kept up to date and expanded by drawing new houses from the universe of building permits. A somewhat larger percentage was drawn from this universe (actually 5 percent) because it was advantageous to be able to analyze happenings in the new house markets as well as for houses in general. By this special listing, separate cells could be established and tabulated for new houses. The cost of setting up the entire sample can be given in man-minutes. There were 1500 units selected in the initial sample, and it took approximately 4 minutes to select and list each. Each lot had then to be checked for characteristics, which took another 4 minutes. Thus the total time for listing and obtaining the characteristics for each lot was 8 minutes. Since only a half of the lots contained single-family houses, the total time to obtain a single-family house in the sample was 16 minutes. Since the sample is semi-permanent, this time is required only initially. The time required for drawing the sample from building permits and listing the characteristics of each house was approximately 7 minutes. This included time spent in rejecting permits that did not fall into the desired group.

The next step was the enumeration of deeds and mortgage information from the official county records. Normally this would follow the procedure of a short title search. In San Francisco as in many other areas such a search—which is not laborious—was not necessary because the necessary information was maintained in the desired form by the

assessor's office and in title companies. For reasons of convenience it was preferable to use the title company's files and we are indebted to the California Pacific Title Company for their aid.

The actual enumeration contained three parts: (1) The search of the property and a check of the current status with respect to oustanding mortgages. This step was necessary to obtain an inventory of all outstanding loans, but also as noted below such an inventory is necessary if one desires to estimate prices from deed information. (2) An annual check of any transactions occurring during a given year with a listing of their recording numbers. (3) Finding the details of each transaction in the official records.

The first step, which required five minutes, is necessary only in establishing the sample. The second step is required each time a survey is conducted. The time required varies slightly with the period between surveys, but averages five minutes. The third step or amount of time spent recording the details of transactions varies directly with the number of transactions. Our pilot study required approximately 8 minutes per transaction for listing from the original records, searching and transcribing the further data. We found approximately 25 transactions a year for every 100 existing properties and about 225 per year for properties with newly erected units. As a result, this step required 2 minutes for each existing property and 18 minutes for each with a newly erected unit.

For many purposes, the information in the public records is sufficient. For other purposes, however, additional data would be desired from the property owner. This was true in the pilot study since it was desirable to check the adequacy of the use of tax stamps for estimating prices. Two questions have been raised concerning this procedure: (a) Is the proper

amount of stamps affixed as required by law? (b) What biases arise because the law in certain cases does not tax the full amount of the purchase price? Since the tax must be paid on only the difference between the price and outstanding loans, this occurs whenever a loan continues to exist both before and after the sale. Since in the permanent sample a record exists of previous loans for each property, these so-called loan-assumption cases are immediately obvious. As a result all deeds can be and in the pilot study were, divided in two groups, those where stamps were expected by law to equal the price and the second where loans were assumed. For the years 1952 and 1953, each of these groups was sub-sampled to check the actual price with either the purchasers, sellers, or the agents for the property. For the first group, the special survey indicated that the average price estimated from the public records alone varied from that reported directly by less than 1 percent.[9] The survey also showed clearly, however, that failure to separate out the second group would have led to sizeable errors. One-third of the properties fell into this group. The average outstanding mortgages equalled 59 percent of the actual price. As a result, tax stamps in these cases showed only 41 percent of the real price. If prices had been estimated without taking the special characteristics of this group into account, the average price shown would have been 19 percent less than the real price. Simply excluding them increased the total bias somewhat since their true price was slightly above that of houses in the first group. As a result of this bias, plus that for the first group, the average price estimated only from the tax stamps of the group which had no outstanding

[9] A similar result is reported in E. F. Schietinger, "Race and Residential Market Values in Chicago," *Land Economics*, November 1954, p. 304.

loans was 2 percent under that obtained in the special survey.

Examples of Data Obtained

The pilot study tested the sampling technique suggested in this article in order to check its feasibility and costs as well as to see whether it could succeed in filling the gaps in existing housing statistics. This section contains examples of the results obtained in the sphere of lending data, sales or deed data, and price data. The following tables indicate the type of information which has been collected. They also show that the present inadequate data system has given rise to general impressions which may well be wrong.

Mortgage Lending

Tables I-III summarize the picture of mortgage-lending which occurred during the period July 1, 1950 to June 30, 1954 in San Francisco. Many of the facts are similar to those which careful observers have gleaned from the market without benefit of statistical information. Some, however, come as complete surprises. While it should be recognized that part of the results may occur because San Francisco may not be a typical area, some of the conclusions which might be drawn from the data have such important policy implications that they clearly should be checked elsewhere.

TABLE I—Mortgages and Deeds of Trust Recorded in the County of San Francisco Between July 1, 1950 and June 30, 1954: Classified by Type of Property and Loan*
(*Number of Liens*)

	Senior Liens			Junior Liens			
	On Existing Houses		On New Houses	Total	On Existing Houses		On New Houses	Total
	Built Pre-1930	*1930 and Later*			*Built Pre-1930*	*1930 and Later*		
Conventional..........	18,870	7,130	1,760	27,760	13,000	4,510	880	18,390
FHA or VA...........	1,310	2,350	2,720	6,380	0	0	260	260
Total...............	20,180	9,480	4,480	34,140	13,000	4,510	1,140	18,650
Purpose:								
Purchase.............	12,400	6,170	4,480	23,050	10,160	3,720	1,140	15,020
Additional Funds......	7,780	3,310	0	11,090	2,840	790	0	3,630

* In addition, construction loans were made and repaid during the period on 2,880 houses. Of these 1,500 were conventional and 1,380 were government insured or guaranteed.

Source: Sample survey for this study.

The confidence limits for any of the above figures can be estimated from the equation

$$S_p = \sqrt{\frac{PQ}{n}} \quad \text{where } P = \frac{\text{figure in table}}{N} \text{ and for existing structures } N = 86,375 \text{ and } n = 734,$$

while for new structures $N = 5,500$ and $n = 275$.

Perhaps most surprising is the high percentage of second or third mortgages recorded. More than a third of recordings fell in this category. In contrast, one reads almost daily in the papers that a major difference between the housing market of 1950-55 and that of 1925-29 is that the government's intervention in the mortgage market has succeeded in wiping out the junior mortgage, with the dangers it poses if incomes fall. In San Francisco at least, this claim of wiping out junior liens could be made only with respect to the market for new houses, yet even here 15 percent of the new houses had conventional junior mortgages, while an additional 5 percent had the FHA-VA combination which could still be recorded during the start of the period.

Another major policy problem is underscored in the tremendous differences between lending practices in the markets for new and existing units. The

government insured or guaranteed over 60 percent of the first mortgages on new houses. On the other hand, the government insured only about 12 percent of the total loans in the period and about the same percentage of senior loans for the purchases of existing houses. Furthermore, and this has almost certainly played a vital role in the present trend to suburbanization and fall of values in the center of cities, the government has insured or guaranteed only 6 percent of first mortgages issued on houses built before 1930 and less than 3 percent of loans made on houses built before 1920. The table indicates the kinds of data required to analyze the government's impact on the housing market which are missing from current official statistics.

Tables I and II also bring out the important role that loans for additional funds play in the mortgage market. Nearly 40 percent of the senior loans on

TABLE II—INVENTORY OF MORTGAGES AND DEEDS OF TRUST WITH CHANGES, SAN FRANCISCO, JUNE 30, 1950, AND JUNE 30, 1954, BY TYPE OF PROPERTY AND LOAN
(*Number of Liens*)

| Houses Built: | June 30, 1950 | Changes During Period | | Reconveyed | June 30, 1954 | |
| | | New Loans | | | | |
	Out-standing	For Purchases	For Additional Funds Senior Liens		Out-standing	Ratio to Houses
Pre-1930...............	17,190	12,400	7,780	11,280	26,090	51%
1930-1950*............	21,220	5,810	3,870	7,260	23,640	67%
1950-1954*............	0	4,480	2,880	3,140	4,220	78%
Total...............	38,410	22,690	14,530	21,680	53,950	59%
		Junior Liens				
Pre-1930...............	5,000	10,160	2,840	7,330	10,670	21%
1930-1950*............	4,530	3,720	790	2,570	6,470	18%
1950-1954*............	0	1,140	0	120	1,020	20%
Total...............	9,530	15,020	3,630	10,020	18,160	20%

* As of June 30.
Source and Sampling Error, see Table I.

existing houses were not related to the purchase of the house. These loans were about equally divided between cases where there were no previous mortgages on the house and those in which an existing mortgage was repaid and additional funds borrowed. This increase in borrowing on houses already owned as well as the sale of debt free-houses to purchasers who thereupon take out a new mortgage is clearly a major factor in the increase in mortgage debt in recent years.

In the four fiscal years, 1950-54, the number of outstanding first mortgages and deeds of trust increased by 40 percent while the number of junior liens nearly doubled. Of the increase in first liens, only 27 percent were on newly constructed houses. The remainder were on existing houses. As a result, the percentage of houses built before June 30, 1950 with a lien rose from 44 percent to 57 percent.

The data in Table III agree more readily with general observations of the mortgage market. Commercial banks are the chief lenders in San Francisco County. They lend on all types of properties and the size of their loans is about the average of all lenders. Insurance companies, on the other hand, specialize almost completely in houses built within the past 25 years. They lend on the larger more expensive houses and lend a somewhat lower percentage of the purchase price. Savings and loan associations and individuals concentrate almost entirely in the market for older and cheaper homes. Their loans are somewhat smaller and have a considerably higher loan to value ratio.

The breakdown between conventional and government-insured or guaranteed loans during the period by type of lender is not shown separately because there is no significant difference between these two groups in either the amount of the loan or the loan to value ratios. Savings and loan associations and individuals did virtually no lending on government loans. Banks were the largest lenders in the

TABLE—III—First Mortgages and Deeds of Trust Recorded in the County of San Francisco Between July 1, 1950 and June 30, 1954: Classified by Type of Property and by Lender
(*Number of Liens*)

	On Existing Homes		On New Houses	Total	Average Amount of Loan	Ratio First Deed to Purchase Price*
	Built Pre-1930	1930 and Later				
Banks	7,440	4,250	2,660	14,350	$7,860	63%
Savings and Loan	7,330	1,080	460	8,870	$6,090	71%
Insurance Co.	1,490	3,530	1,120	6,140	$9,670	60%
Individuals and Others	3,920	620	240	4,780	$7,420	86%
Total	20,180	9,480	4,480	34,140	$7,650	66%

2nd Deeds of Trust: Banks, 630; Savings and Loan, 290; Individuals, 17,730.

* Applies to purchases of existing houses only.
Source: See Table I; Sampling Error for Numbers, see Table I: For values, see Table V.

insured-guaranteed loan sphere and more than 70 percent of their loans on new houses were of this type. About half of the loans made by insurance companies on new houses were governments also.

Market Activity

There has been a great deal of interest in the use of number of deeds recorded as an indicator of market strength. Since total deeds recorded are fairly readily available, several studies have used such a series as the basis of their analysis. Table IV shows the number of actual sales (usually spoken of as bona fide deeds) of one-family houses in San Francisco for the past 43 years and compares these sales to deeds recorded on all properties as well as to all deeds recorded on one-family houses (other types are gifts, probate, tax, quit claims, etc.). This table confirms other similar studies in finding that total deed recordings are not a very accurate measure of changes in sales. For an accurate sales index one must examine a sample of deeds and classify them by type of property and also into sales and non-sales since the ratio between these groups varies considerably in different types of markets.

Houses actually traded in the market were only 21 percent of total deeds during the depression years of 1930-34 while they were more than double this percentage in 1950-53. In the latter period, use of deed data alone would have indicated a decided drop in activity between the period 1947-49 and 1950-53, while in actuality house sales rose. These divergences occur both because houses can move in a manner dissimilar to sales of other types of property, but also because

TABLE IV—Deeds Recorded in County of San Francisco Classified by Years, and by Type of Deed

Type of Deed	Average Number of Deeds Per Year (000)							
	1920–24	1925–29	1930–34	1935–39	1940–44	1945–46	1947–49	1950–53
All Deeds.....	18.9	20.6	12.5	15.1	17.1	26.0	23.9	19.4
On One-Family Houses	5.4	7.1	6.2	6.9	10.8	13.4	12.3	12.2
Bona Fide Sales of One-Family Houses	3.9	4.4	2.7	4.3	7.6	10.4	8.3	8.6
Bona Fide House Sales Percentage of:								
All Deeds.....	20.8%	21.6%	21.2%	28.7%	43.5%	40.2%	34.9%	44.0%
One-Family House Deeds..	72.3%	63.0%	42.9%	62.7%	70.0%	77.8%	68.0%	70.6%

N = 91,000 and n = 781

Source: All deeds from Recorder's reports; Deeds on one-family houses from sample survey for this study.

deed data include many transactions such as gifts and wills which are not *bona fide* sales.

The percentage of sales of houses has risen steadily when compared to all recordings. This is not unexpected as more and more vacant lots get built upon. Part of the observed change, however, may be due to the fact that some single family houses in the earlier period may not appear in the index because they have been converted or demolished.

Tables not included which show sales by age of house in each period indicate only minor variations by age with two exceptions: (1) Houses are far more likely to be sold in a short time by their first or second owner. Many people must have noted the rapid changes in ownership which occur in new neighborhoods. The data confirm this fact. Houses under five years of age have a more rapid turnover than older houses and this was true in the twenties as well as recently. (2) The very old houses sold at a more rapid rate in the immediate postwar period. This was almost certainly a transfer from rental property to ownership and is reflected in the higher rate of home ownership. The figures give no indication as to whether this was caused by rent control or simply by the fact that marginal houses which could not be sold and had to be rented during the 1930's could be sold in the postwar period because of the tremendous increase in demand.

Throughout the period since 1920 houses were sold on an average of once every 12.5 years. This is a somewhat less rapid sales rate than has usually been estimated. One of the factors which have led to higher estimates of sales activity is the fact that on the average one deed was recorded for each house once each eight years. This difference simply

reflects the large number of deeds which do not record sales.

Value of Houses

Table V presents data on the average value as evidenced by actual selling prices of all houses in San Francisco. The table shows current values in each period of all existing houses and thus includes effects of depreciation and of additions of new houses to the stock. It so happens, however, that in each period since 1940 the average new house built in San Francisco sold at a price slightly under the price then prevailing for older houses. As a result, including these units in the index has meant that it does not rise quite so rapidly as would an index of changes in the prices of houses built prior to 1940.

The effect of the postwar housing boom and changes in the price level is clear. Houses rose steadily in price from 1940 on and the level for the years 1950-53 was slightly more than double that prevailing during the war and immediate prewar period.

The basic data show that most period-to-period changes in the prices of houses of different ages have no significant variations with one interesting exception. Anyone buying a house in the period 1935-39 would have been much better off in monetary terms if he had bought a house built in the 1930's instead of the 1920's. He could have bought the newer house for somewhat less and could have sold it in the later period for nearly 50 percent more.

What accounts for this difference? While we cannot be certain, two hypotheses may throw some light on the question. It appears that it took a long time to squeeze the water out of the market of the 1920's. The prices of these houses dropped slowly and continued to drop until nearly the end of the war. As a result they were still over-priced in

the 1930's. Houses built in the later period, on the other hand, were apparently very competitively priced. Secondly, available financing for these units has been on much better terms in the postwar period and this may account for their higher prices.

The price index of Table V differs considerably from other housing price

TABLE V—Average Value of Houses in San Francisco Classified by Age and Years

Year House Built	1935–39	1940–44	1945–46	1947–49	1950–53
		Value in Dollars			
Before 1930..	5,460	5,690	8,310	10,110	11,060
1930 and after......	6,410	7,020	10,180	12,290	14,140
All Houses...	5,690	6,150	9,010	11,000	12,320
		Index 1950–53 = 100			
Before 1930..	49.4	51.4	75.1	91.5	100
1930 and after.......	45.3	49.6	72.0	86.9	100
All Houses...	46.2	49.9	73.6	89.5	100

Confidence limits at 1 s.e. all houses in 1950-53 =

$12,320 $\overline{+}$ 1.46%
Source: Sample Survey for This Study.

indexes currently available. It seems, however, to give a greater accuracy than others and to agree with what is usually meant by changes in prices or values. Its basic assumption is that the prices of houses of a certain type which are sold in the market are a sample of the prices or values for all similar houses. All houses in the county were divided into 44 cells based on an area and age cross-classification. A price estimate for each cell in each period was obtained by taking the mean price of all properties within the cell which sold without loan assumptions. The average price for all properties is a weighted average of these cell-means with weights proportional to the number of properties in a given cell

compared to the total number of houses in the city.

As indicated in the discussion of drawing the sample, it is important to use a weighted average based on the total number of houses of each type rather than on sales alone if one wants to measure changes in values. This occurs because if one simply averages the prices of houses actually sold one gets a haphazard weighting which depends on the number of sales. Since at any time the percentage of newly and recently constructed houses sold is higher than their share of all houses, their weight would be higher in a haphazardly weighted index. For example, in 1950-53 the so-called "unweighted" price of houses sold was $14,070 or 14 percent above the weighted average.

Conclusions

The use of a carefully designed sample of properties to be surveyed periodically in the public land records appears a feasible method of gathering housing market data. The fact that properties are identified and that one has knowledge of outstanding liens removes several of the most important difficulties which have plagued users of recordings in the past. Because the sample is drawn on a probability basis, the sampling error can be specified and steps can be taken to narrow the confidence limits as much as is des able.

The sample results obtained indicate that specific knowledge of types of houses, types of loans, and of prices may be important for market analysis and for evaluating policies. We are probably entering a period when the variations in market forces for houses differing in age, in price, and in area will play a vital part in determining aggregate market action. A failure to obtain necessary information on the component parts of the housing stock may be extremely costly.

Reports and Comments

Rural Underemployment and Industrial Development in the Wisconsin Headwaters Country†

I. Rural Underemployment in the Headwaters Country

THERE are approximately 3,500,000 underemployed families to be found in all parts of the United States. Underemployment is most often associated with the Southeast and Southwest parts of the Northwest, and the cutover region of the Great Lakes area.[1] Wisconsin, although generally thought of as a state with a prosperous agricultural economy, has a large agricultural population in the cutover section, of which the Headwaters Country is a part, which must be classed as underemployed.

Underemployment is best measured in terms of productivity.[2] Labor is underemployed in a particular field if its productivity is below that in alternative lines of economic endeavor. Thus rural underemployment exists when the productivity of agricultural labor is lower than it would be in various alternatives. Lower productivity may result from a variety of forces including poor land, farms of an uneconomical size, lack of capital, imperfect knowledge, lack of non-farm jobs, or immobility. Of course, if there were complete mobility both geographical

and occupational, there would be no underemployment.

There are several factors which may be used to indicate the existence of rural underemployment. Whatever the indicators used, the counties of the Headwaters Country are far below the comparable figures for counties in the southern part of the state, and they are generally below the state average. (See Table I.) Only two counties, Langlade and Oneida, exceeded the state average of $5,246 worth of product sold per commercial farm and the status of the two counties reflected the importance of commercial potato farming. In terms of the value of output sold per acre of land and output per farm worker, nearly every county in the region was below the state average. Likewise, the value of farm products sold and the level of living for farm-operator families was far below that of the southern part of the state and, in most instances, the state average. A larger percentage of the farmers have non-farm employment in the nine counties of northern Wisconsin and it would be higher even if more employment opportunities were available.

It is to be expected that a farming region will lose population through migration. The rural population of the Headwaters Country, however, has suffered a much greater loss through this process than either the state or the southern counties.[3] The smaller losses or the gains among the nine counties represent (1) the increase in fringe population around the cities, or (2) the tourist and resort industry which has attracted people to the rural areas. In neither case is the explanation to be found in agriculture.

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[1] *Underemployment of Rural Families*, Washington, D. C.: The Joint Committee on the Economic Report, Subcommittee on Low Income Families, 1951, pp. 5 and 6.

[2] C. E. Bishop, "Underemployment of Labor in Southeastern Agriculture," *Journal of Farm Economics*, May 1954, page 260.

[3] M. J. Hagood, and E. F. Sharp, *Rural-Urban Migration in Wisconsin, 1940-1950*, Madison, 1951.

County	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Forest	$1,195	$2,792	$12.22	26.5%	20%	−34%	107
Langlade	2,392	5,389	32.68	14.3	25	−26	134
Lincoln	1,471	3,430	18.34	20.4	24	−21	131
Marathon	1,754	4,268	27.38	13.1	21	−12	135
Oneida	2,529	6,434	16.56	22.6	19	+ 1	126
Portage	1,679	3,670	17.94	21.4	23	−20	132
Taylor	1,502	3,332	20.82	20.1	20	−36	129
Vilas	985	3,875	12.84	40.1	21	− 6	126
Wood	1,727	4,101	25.71	14.9	20	− 9	154
Dane	3,764	7,524	53.72	4.9	16	− 3	184
Green	3,860	8,578	51.43	4.3	18	−10	185
Jefferson	3,002	6,239	51.19	6.1	17	− 8	174
Kenosha	4,102	8,128	58.11	10.5	12	+29	162
Wisconsin	2,494	5,246	32.93	13.5	19	− 8	149

(1) Value of product sold per farm worker, 1950.

(2) Value of product sold per commercial farm, 1950.

(3) Value of product sold per acre of farm land, 1950.

(4) Percentage of total farms with value of product sold between $400 and $1,500, 1950.

(5) Percentage of farm operators working off the farm more than 100 days, 1950.

(6) Population changes through migration as percentage of total rural population in 1940.

(7) Level of living index, 1950.

* 1950 Census of Agriculture; M. J. Hagood, Farm-Operator Family Level-of-Living Index; and M. J. Hagood and E. F. Sharp, Rural-Urban Migration in Wisconsin, 1940-1950.

II. Non-farm Employment Opportunities

The major problem confronting the Headwaters Country is that of providing an enlarged number of employment opportunities for those who are currently underemployed and for at least a part of those who leave the region each year. An agricultural economy can seldom expect to retain all of its population, but neither is it inevitable that such a large proportion should leave the area as is the case in Northern Wisconsin. Sufficient employment opportunities should be available so that there would not be a net decrease in the population of the nine counties.

Primary interest is in the basic industries which bring new income into the region rather than the non-basic industries which result in an intra-regional shift of income. The latter are a passive rather than an initiating force. By increasing employment in the basic industries and bringing additional income into the region, an increased number of employment opportunities in the non-basic industries will follow.

There are three possible fields in which the number of employment opportunities might be increased—agriculture, industry, and the basic service industries. Agriculture has been declining in importance in terms of the number employed. Much of it is of a marginal type and all is highly seasonal. The basic service industries, largely tourist and resort, likewise offered limited possibilities in that they are confined to the northern part of the region and in addition are highly seasonal. The tourist and resort industry has an additional disadvantage since its seasonal peak coincides with the seasonal peak in agriculture. Thus the added employment opportunities are available when least needed.

Of the three, industrial development offers the most promise for expanded employment opportunities throughout the nine-county region. The problem is one of ascertaining what types of industry are peculiarly suited for the conditions prevailing in the Headwaters Country or, on the other hand, will suffer least from the disadvantages.[4]

There have been three periods during which most of the firms in the region were founded. The first followed the early logging period and the construction of the railroads at the turn of the century. The second was the decade of industrial prosperity during the 1920's; and the last followed World War II. There have been several factors which were of significance in the locating of industry in this area in the three periods. They include: (1) local raw materials, (2) markets, (3) available venture capital, (4) the labor supply, and (5) the human factor in ownership and management. Transportation is not included as an advantage since most firms which located in the Headwaters Country were not influenced by transportation facilities. However, the transportation facilities explain why one location was preferred to another within the region.

III. Raw Materials

Historically, the local availability of raw materials has been the most important factor in attracting industry. During the first period of industrial development, timber furnished the basis for the establishment of the paper and woodworking industries. A few of the firms locating in the Headwaters

[4] Information on the location of industry was obtained in interviews with management personnel throughout the region during the period 1951-1953.

Country during the 1920's and following World War II still depend upon locally available raw materials for the production of boxes, children's furniture, etc. At the present time, however, the producers of millwork and other wood products import the raw materials from the Pacific Northwest or the South, and the paper mills import much of the raw materials from Canada.

The woodworking and papermaking industry constitutes the single largest source of employment. It continues to expand in spite of the fact that the raw materials are no longer available locally. The reason for this is not too difficult to discern. An industry which has been established in a locality for a number of years will attract new firms in the same, or closely related, industrial lines. As it used up the local raw materials, the industry developed another factor which continues to attract firms to the area. The Headwaters Country has continued to attract new millwork firms because of the trained labor force.

There are two other industries which are oriented toward the raw materials. The first includes those using the products of local agriculture. With the exception of the general dairy plants, the food processing plants use local raw materials to manufacture products which are sold in a nationwide market. The second group includes those firms using local mineral resources. The best known of the group is the Wisconsin red granite which is marketed under various trade names. There is some utilization of quartzite, a little production of building stone and brick in addition to a considerable amount of sand, gravel, and rotten granite. With the exception of red granite and the quartzite roofing granules, the above are marketed locally.

In the majority of such industries there is a large weight loss in the manufacturing process. Thus the location near the raw material has an advantage over the more remote sites. In the manufacture of monument stones approximately 80 percent of the stone taken from the quarry is waste, and in the woodworking industry the weight loss is approximately one-third. Unless there is some offsetting circumstance which lessens the cost of transportation and imposes a like burden upon all producers such a weight loss requires that processing take place near the source of the raw materials. In the wood-working industry the firms are far removed from the source of the raw material, but they are able to take advantage of the fabrication-in-transit rates on most of their output. Furthermore, since they all obtain their raw materials from the same source, the weight loss does not impose an undue disadvantage upon any individual producer.

The possibilities for expanded employment opportunities in raw-materials oriented industries are limited. Woodworking firms coming to the region do so for reasons other than the local supply of raw material. Industries based on the agricultural output of the region have the same seasonal characteristics as agriculture, and they can offer little in the way of a permanently increased number of job opportunities. For the most part, those firms using local mineral resources produce for a regional or local market and their employment opportunities are limited.

IV. Markets

Originally, firms were established in the Headwaters Country to serve local markets of two types—consumer and producer. The market for the consumer goods still exists, but the market for producer goods and consumer durable goods is either drastically changed or no longer exists. Whereas at one time the output of the latter was marketed locally, the market now has become national or international in scope. Many of those interviewed reported that at the present time less than 1 percent of the output is being sold in the area which took the entire output at the time of the firm's founding. In some instances there has been a complete change in the product produced in addition to the change from local markets to national markets.

Many of the firms were established at a time when there was little competition from the more developed sectors of the country. With the development of the regional economy came competition from the outside and the firm which originally conducted a purely local enterprise was forced to expand. The outside producer, because of his larger output, was able to sell in northern Wisconsin at a price below that of the local producer. The local firm was required by the forces of competition to expand operations and enter larger markets in order to reduce costs and maintain his competitive position.

The possibilities of further development of industry based on a local or regional market are limited. The population of 267,809 in the Headwaters Country constitutes an extremely small market. If all of northern Wisconsin and Upper Michigan were included, the market would include approximately 1,500,000 persons. If a firm were established to serve this larger area, it would, in all probability, serve the contiguous area in Minnesota, and might find locations which would be superior to any in the Headwaters Country.

V. Venture Capital

A third factor of importance as a determinant of industrial location has been the locally available venture capital. This was particularly true in the first two periods of industrial development. Venture capital should probably have very little effect on the location of industry since it is, or at least could be, very mobile. If man were a rational being interested solely in profit maximization, capital would move toward the area of maximum return. In the Headwaters Country the reverse has often been the case. The individuals financing a firm often insisted that the firm locate locally and in some instances a local site was chosen in face of the fact that the location was of a non-economic nature.

A large part of the original lumber fortunes has remained in the area and over the years it has been an important factor in the establishment of firms in no way related to lumbering or woodworking. Firms in such diverse lines as sporting goods and automobile parts have located in the area because of local capital and in spite of local disadvantages.

Presumably, a region such as the Headwaters Country will be characterized by a shortage of venture capital.[5] The availability of capital is analogous to underground water; that is, they both exist but both may be inaccessible. In the earlier stages of development of this region, capital was in the hands of a comparatively few individuals. Today, however, there is not the same concentration of wealth. Moreover, the risk in developing new industries in an underdeveloped economy is serious. So great is the risk, in fact, that a single individual or a small group of individuals may be unwilling to assume the undertaking. This necessitates the use of a

vehicle which will spread the risk over a large number of people. In meeting this problem the industrial development corporation has enjoyed a high degree of popularity, and many have experienced a notable degree of success in raising capital for industrial development projects.

VI. Labor

The existence of underemployment is indicative of a resource of major importance —labor. While some of the other factors important in industrial development no longer exist, the advantages to be found in the labor force are currently existent. An excess of births over deaths and continuing technological changes in agriculture, in addition to rural underemployment, indicate that the rural population will continue to be a source of labor for industrial development.

The first advantage in the regional labor force is that of lower wages. Wages received by workers in parts of the region are among the lowest in the entire country. Such industries as lumber products, food processing, apparel, and leather products, which are major sources of employment in many Headwaters communities, are generally classed as "low-wage" industries. As a result, the earnings of employees in the Headwaters Country are below that of the state as a whole and very much below that found in the southeastern part of the state.

Most of the employers interviewed felt that the local wage rates were below the wage rates for comparable jobs in the southeastern part of the state. Since productivity was not correspondingly lower, it was felt that there was an advantage in lower wage cost; in fact, many thought that it was only by paying lower wages that they were able to continue in operation.

The fact that wages are lower in the region does not constitute an absolute advantage for local industry. Lower wages are in the nature of an offsetting advantage. Because of the geographical isolation of the region, increased transportation costs are offset by lower costs of production and this most often takes the form of lower wage costs.

The existence of a lower wage structure should not be interpreted as an advantage to be exploited in the attraction of new industry. A community which does so may be promoting an unstable situation for the continued existence of lower wages cannot be

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[5] E. M. Hoover, *The Location of Economic Activity* (New York: McGraw-Hill, 1948), p. 192.

guaranteed. In fact, the very action of promoting further industrialization may be the factor bringing about wage increases. There is the added fact that the firm which is interested only in lower wages may not be the type of firm which the community desires to acquire.

The second advantage to be found in the labor force is the element of stability. It was the unanimous opinion of those interviewed that living and working in a smaller community contributes to a stable labor force. Nearly all commented upon the existence of a "family feeling" in the plant.

The consequences of this stability are twofold. First, there is nearly complete absence of what might be termed "radicalism" in the labor force. In the unionized plants management spoke very highly of their counterpart in the union. On the whole, labor relations have been harmonious and little time has been lost because of labor disputes.

A second result is a low rate of labor turnover. Many firms have a core of their labor force which has been with the firm for a number of years. Of such firms, Marathon Corporation is an outstanding example. Of the male workers, 60.1 percent had been with the company for five years or more in 1946.[6]

The third and most important advantage to be found in the local labor force is the existence of a surplus supply of labor. As in the South, it is the availability of labor rather than the wage cost which is of significance in industrial development.[7] Such an excess of labor is of greater significance during a period of general prosperity than would be the case during a period of widespread unemployment. Thus a program of industrial development based on available labor has a better chance of success during a period of general prosperity. As unemployment becomes more widespread the local advantage is of less significance.

Determining the number of potential employees in an underemployed rural population presents a difficult problem. The productivity of the group as well as their desire for additional employment must be considered. If it were merely a matter of productivity, estimates based on Census data would have some validity; however, the necessity of considering the desires of the population makes it extremely hazardous to make such estimates. The only completely satisfactory techniques would be the inclusion of an underemployment questionnaire by the Bureau of the Census in the Census of Population.[8]

The interviews, conducted between 1951 and 1953, provide some qualitative data as to the availability of labor. Although this was a period of high employment, all of those interviewed emphasized that there was no shortage of labor. In one instance, an employer was able to replace a work force of approximately 400 employees when the plant was struck. There were numerous additional instances when local employers were able to utilize the local potential to be found in the rural population. There was, however, only one attempt at measurement. The Tomahawk Chamber of Commerce mailed 2000 "boxholders" to individuals in the surrounding area. In response, 220 persons expressed an interest in obtaining non-farm employment. It is possible to conclude that a substantial labor force is available, but it is impossible to make any quantitative estimate of its size.

The most serious disadvantage in the regional labor force is the acute shortage of skilled labor. In the cities of the Headwaters Country eleven to fifteen percent of the non-agricultural employees are classed as skilled. This compares with twenty-one percent in Racine, Wisconsin. Other cities in the southeastern part of the state have a much larger percentage of their non-agricultural employment classed as skilled than is the case of the Headwaters Country.[9] This shortage of skilled labor is felt most severely by the metal-working firms and some of the more technical industries requiring a high degree of skill. On the other hand, the shortage of skilled labor is much less severe for the woodworking industry. Nearly all of the cities of the region have a long tradition in woodworking, and such an environment will in-

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[6] E. E. Witte and R. Fleming, *Marathon Corporation and Seven Labor Unions* (Washington, D. C.: National Planning Association, 1950).

[7] R. T. Eastwood, "Labor as a Factor in the Location of Industry," *University of Alabama Business News*, April 15, 1952 and G. E. McLauglin and S. Robock, *Why Industry Moves South*, National Planning Association, 1949.

[8] F. S. Berdecia and A. J. Jaffee, "The Concept and Measurement of Underemployment," *Monthly Labor Review*, March 1955, p,. 283.

[9] Wisconsin State Employment Service. These figures are contained in *Basic Statements* published for the cities of the state.

culcate the necessary attitude toward the industry in addition to fostering the required skills.

VII. The Human Factor in Ownership and Management

Like the rest of the country, the Headwaters Country has had a number of individuals who have been interested in maximizing satisfaction rather than profit. There have been a number of persons who established their firm in the region because it was their home town and they had no desire to leave. Others expanded hobbies into fully developed industrial firms. There is no way of measuring the significance of this element in industrial development but, in any case, it does not appear to be of major significance at the present time.

The human element is an important factor for corporate management. Obtaining satisfactory management personnel represents a major problem for local industry at the present time. Those firms founded during each of the three periods of industrial development are experiencing "growing pains" insofar as management is concerned. There are firms in all three groups which are undergoing changes in management personnel and in many instances it is impossible to obtain satisfactory personnel from local sources.

The region does not have the facilities for higher education which would promote the founding of new business enterprise. Too often, those who do obtain a higher education fail to return to the area. Technical training which has given New England's economy such a stimulus is not locally available. Not a great deal, then, can be expected in the way of increased employment opportunities resulting from the human element; in fact, obtaining competent technical and management personnel is apt to continue as one of the region's major problems.

VIII. Transportation

Although the transportation facilities are important in determining plant site, there are no industries in the Headwaters country which are transportation-oriented. The major problem facing regional industry is that of location—the handicap being the result of two factors. First, few firms depend upon northern Wisconsin, or even the state, as a market for the product. Industry depends, in large part, on a nationwide market with the largest part of that market located to the south and east of Wisconsin.

Second, few firms depend upon local sources for their raw materials. Any firm which obtains raw materials from the area to the south and east of the Headwaters Country and sells the output in the same area suffers a severe locational handicap. Local metal working firms are so oriented; and they suffer a competitive disadvantage compared to better located firms. The woodworking industry does not so suffer as the major part of the raw material is obtained from the north and west and the product is marketed to the south and east. For this industry there is a continuous movement of raw material and finished product in a single direction, and in no case is there a backhaul such as is to be found in many other industries.

IX. Conclusions

To make maximum use of the area's assets and to minimize the disadvantages of the region, a new firm should have at least some of the following characteristics. First, it should be labor oriented; however, it should not be solely interested in the low-wage features of the region. Furthermore, it must be prepared to meet the difficulties involved in the shortage of skilled labor and management personnel.

Second, the new firm should contribute to the diversity and stability of the local economies. The area does have more advantages for firms which are presently represented in the region; and continued industrial development will have a tendency to increase industrial concentration.

Third, the new firm should be such as to minimize the locational handicap. This can be done by producing a product which has a high value in relation to bulk and weight; by producing a product which will have a continuous flow of raw materials and finished product in a single direction; or by producing a unique or quality product.

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Industrial Deconcentration as a Factor in
Rural-Urban Fringe Development

FOR some time the movement of population from the large city to suburbs or commuter towns has attracted considerable attention.[1] The growth of suburbs and the rural-urban fringe has been associated with a general redistribution of the population—outward from the cities and movement inward from the open country.[2] More recently the spread of industry from the congested city into areas that surround the city has received increasing attention from social scientists and others. Part of this interest is due to the development of modern methods of warfare which makes it possible for long-range aircraft and guided missiles to threaten any part of the earth. The literature urging decentralization and dispersion of population and industry are, in part, a reflection of world conditions as well as a function of strictly local problems in congestion. No attempt will be made here to summarize the large body of literature that has appeared recently on the subject of population and industrial decentralization. It is certain, however, that the present relationship between the rural and urban areas would be greatly changed by the proposals in the literature. Some of these proposals and forecasts indicate that there will be a "ruralization" of industry—a movement from the congested city to the open cornfield. This paper indicates that this is not happening in at least one of our largest and most important metropolitan areas. Rather, it shows that the develop-

ment of industrial villages and towns may be the future pattern of both industry and population.

Like population, industrial development is an index to the shifting balance between metropolis and country. From the viewpoint of the residents of rural towns the advent of industry is a mixed blessing. It may mean that new residents will flow into the town and create problems of housing, schools, etc. As the population becomes more heterogeneous and diversified with respect to occupations and places of work then there are bound to be significant social changes in the rural areas.[3] Almost every area of social life is affected by changes in the occupational and industrial structure of the community: The associational ties of the people may be radically altered under the impact of such changes, new churches may be formed or old ones modified, and the character of local government also undergoes changes. If the newcomers happen to be former urbanites following the movement of industry away from the city, then there may be clashes of attitudes and values to compound the other types of social problems. In short, the inhabitants of the region must make new adjustments and achieve new balances in the habitat.

This paper presents the major findings of a descriptive statistical study of the changes that have taken place in industrial growth in the rural-urban fringe of the Chicago Standard Metropolitan Area (S.M.A.) for a twenty-five year period, 1926-1950. The study indicates in a general way some of the social and economic consequences that may follow in the suburban and rural-urban fringe from such industrial development. The data pre-

[1] "The Rural-Urban Fringe," a Special Feature, *Rural Sociology*, June 1953. See also the following publications: N. L. Whetten and E. C. Devereaux, Jr., *Studies of Suburbanization in Connecticut, Windsor*, Connecticut Agr. Expt. Sta. Bul. 212, Storrs, 1936, and others by this group; Robert J. McFall, "Urban Decentralization" in *Economic Essays in Honor of Wesley Clair Mitchell*, (New York: Columbia University Press, 1935), pp. 297-307; Chauncey Harris, "Suburbs," *American Journal of Sociology*, July 1943; Homer Hoyt, "Forces of Urban Centralization and Decentralization," *American Journal of Sociology*, May 1941, p. 852; Walter Firey, *Social Aspects of Land Use Planning in the Country-City Fringe*, Michigan Agr. Expt. Sta. Bul. 339, East Lansing, 1946; Solon T. Kimball, *The New Social Frontier—The Fringe*, Michigan Agr. Expt. Sta. Bul. 360, East Lansing, 1949; Noel Gist, "Developing Patterns of Urban Decentralization," *Social Forces*, March 1952.

[2] Myles W. Rodehaver, "Fringe Settlement as a Two-Directional Movement," *Rural Sociology*, March 1947, pp. 49-57, and Vincent H. Whitney, "Rural-Urban People," *American Journal of Sociology*, July 1948, pp. 48-54.

[3] Liston Pope, *Millhands and Preachers* (New Haven: Yale University Press, 1942); Lowell J. Carr and James E. Stermer, *Willow Run* (New York: Harper and Bros., 1952). See also the discussion in D. C. Miller and W. Form, *Industrial Sociology* (New York: Harper and Bros., 1952), Chap. 21; and Wilbert Moore, *Industrial Relations and the Social Order* (New York: Macmillan, 1950), Chap. 22; Robert Dubin, "Factors in the Variation of Urban Occupational Structure," unpub. M.A. Thesis, University of Chicago, 1940; Kate Leipmann, *The Journey to Work* (London: Kegan Paul, Trent Trubner and Co., 1944); Paul Landis, *Three Iron Mining Towns: A Study in Cultural Change* (Ann Arbor: Edwards Bros., 1938).

sented below show two types of industrial development: (1) manufacturing establishments that moved from Chicago, and (2) new establishments (including branch plants, newly organized plants, and establishments that relocated from outside the S.M.A.). The relationship between population and industrial growth for the period 1940-1950 are also analyzed in this study.

Data and Method

The major source of data for the location of industry and the movement of industrial establishments in the S.M.A. were the utility companies of the Chicago area whose records for the period 1936-1950 were made available to the writer.[4] An earlier study of industrial location in the Chicago region was used to supplement these data and provided material for the period 1926-1932.[5] Three hypotheses were tested by the data: (1) whether the industrial establishments that locate in the S.M.A. tend to settle adjacent to the city, rather than to locate in the open-country or to form new towns; (2) whether the location of industry in the S.M.A. results in the formation of "concentrated" nuclei or clusters of industrial communities, rather than long, thin ribbon developments along railroads and highways; (3) whether the growth of population and the settlement of industry in the S.M.A. are concomitants.

The data were analyzed by reference to a system of sectors and zones that divided the S.M.A. into 21 geographical segments. The sectors radiate outward from Chicago resembling spokes of a wheel; on the other hand, the zones are drawn in rough concentric fashion. The sectors were determined on the basis of main routes of transportation, population, and civil boundary lines. The zones were established primarily on the basis of existing township lines in the S.M.A. The zones were labeled A through E, with Zone A representing the township adjacent to the city, and Zone E embracing the area farthest from the city; it was possible then to examine the distribution of industrial plants in terms of their proximity or distance to the city. The

sectors may be referred to in terms of their directional pattern, thus: North, Northwest, West, South, and Southeast.

Results

The presentation of the data below is in terms of (a), the location trends of industrial plants that moved from Chicago, (b) the location trends of new establishments, and (c) the population changes in the S.M.A. in relation to industrial location trends.

Movement of Industrial Establishments from Chicago. Data on the movement of industry from Chicago to the S.M.A. outside the city were available from the utility companies for the period dating from 1936. Table I shows the movement of industry out of the central city by five-year intervals. It is interesting to note that in the five-year period, 1946-1950, the number of establishments that left Chicago for the S.M.A. increased more than five-fold over each of the preceding five-year intervals. Analysis of these data for the 1936-1950 period indicated that the industrial plants that moved from Chicago tended to maintain accessibility to the central city, while at the same time they secured the benefits of suburban locations. Apparently, the desire to relocate outside of the congested city was counter-balanced by the desire or need to maintain proximity to labor, markets, and transportation advantages. Many of the industries that left Chicago tended to cluster in certain industrial areas outside of the city. For example, the Clearing Industrial Districts in Skokie, Melrose Park and Clearing attracted a large number of establishments. Other clusters were found in the industrial areas of Franklin Park, Blue Island, Cicero, and Schiller Park. It was apparent that the location pattern was one of clustering or concentration in small suburban areas rather than ribbon-like development along major transportation arteries.

TABLE I—Establishments That Located in the S.M.A. by Five-Year Intervals. 1936-1950

Time Period	New Establishments		Moved From Chicago	
	No.	Percent	No.	Percent
1936–1940........	76	14.59	38	11.76
1941–1945........	113	21.69	55	17.03
1946–1950........	332	63.72	230	71.21
Total.........	521	100.00	323	100.00

[4] The two utility companies, Commonwealth Edison Company of Chicago and Public Service Company of Northern Illinois, are operated by the same management. Records were made available to the writer by the industrial development sections of these companies. The data presented here are limited to establishments employing ten or more workers.

[5] William Mitchell, *Trends in Industrial Location in the Chicago Region* (Chicago: University of Chicago Press, 1933).

In terms of the concentric pattern of location, at least 78.0 percent of the plants that moved from Chicago to the S.M.A. in the 1936-1950 period located in Zone A. In contrast, eight percent of the establishments that moved from the city located in the next tier of suburbs in Zone B; similarly, eight percent of the plants settled in Zone C, primarily in the North Chicago-Waukegan industrial area. Only 4.6 percent of the plants that left Chicago located in the outer belt of towns in Zone D, 25-35 miles from Chicago. Zone E, farthest away from the central city and with few cities, attracted only one establishment. The 1946-1950 period marked the first time, in the fifteen years covered by this study, that establishments had moved from Chicago to points as far away as Zones D and E in the S.M.A. Perhaps the A-bomb and government policy encouraging dispersal of plants had some effect on the managers of these plants.

Directionally, the establishments that left Chicago located in the sectors of the S.M.A. as follows: West, 91 plants (28.2 percent); Northwest, 87 plants (27 percent); North, 82 (25.4 percent); South, 57 plants (17.6 percent); Southeast, 6 (1.5 percent). These figures show a tendency for establishments to locate North and West of the city. One possible explanation for the difference between the number of establishments that located in the Southeast sector as compared to the number that moved to the other four sectors may be the fact that the Southeast sector is a greater distance from the Loop than the other four sectors. This factor of distance may influence industrial management to seek suburban locations that will afford greater accessibility to the Central Business District where many of them maintain central offices. Furthermore, the fact that Hammond and Gary, both of which are in the Southeast sector, are rather heavily industrialized cities tends to place them somewhat apart when compared to other suburban locations.

Examination of the twenty-five year pattern of location of the plants that moved from the city to the S.M.A. shows that there is a slight downward movement in the percentage of plants that have located adjacent to the city, and an accompanying increase in the percentage that have located in the outer zones. Nevertheless, during the 1926-1950 period about 80 percent of the establishments

that moved from Chicago located in Zone A. The percentage of plants that located in Zone B showed an upward movement until the 1946-1950 period and then a downward movement set in; the twenty-five year trend in this zone indicates a gradual upward movement in the attraction of industry from Chicago. Zone C showed sharp fluctuations in the percentage of industry that located there; recently the trend has been upward. Zone D, embracing the communities in the Fox River Valley, showed similar fluctuations; too few plants had located in Zone E to indicate any kind of trend.

Data was available to analyze the industrial movement out of Chicago to the S.M.A. in terms of the original location of these plants. These data showed that in the ten year period, 1940-1950, 140 establishments moved from the core of the city to the S.M.A.; this represented 56.22 percent of the total number of plants that moved from the core during this period of time. In terms of the total number of plants from Chicago that located in the S.M.A. in this period, the core plants represented 49.12 percent or almost one half of the total. No reliable data were available on the number of establishments in the core or outer zones of Chicago. Hence, it is impossible to establish the relative proportions of industrial firms that moved to the S.M.A. from the core and outer zone of the city. On the other hand, one can make estimates on the basis of informed guesses and state that there is a proportionately greater movement from the core to periphery points. In fact, the centrifugal movement of industrial firms was apparent for both the core and outer zone. This type of movement corresponds to the basic underlying ecological organization of the city, where the lines of growth have always been outward from the center. It is possible that, as the city grows by annexation of suburban areas, there will be further movement out in a centrifugal fashion. Or, one may postulate that as the new industrial communities themselves grow, there will be further centrifugal movement of these industrial firms.

Location Trends of New Establishments in the Standard Metropolitan Area

A larger number of new establishments located in the S.M.A. than the number of establishments that had moved from the city in the 1936-1950 period. In each successive

five-year period the number of establishments that located in the S.M.A. increased (see Table I). Of course, these data reflect in part the changes in the national economy that were occurring as the nation moved out of economic depression into a wartime economy with a high rate of production which continued into the post-war period. The data show that 48.8 percent of the new plants located in Zone A adjacent to the city; percentagewise, this is in sharp contrast to the plants that moved from Chicago and located in this zone in the same time period. There was another important change in the pattern of industrial location in the postwar period. Zone D, particularly the communities in the Fox River Valley and the city of Joliet, including its suburb Rockdale, attracted 26.2 percent of the new establishments in the S.M.A.; only 6.5 percent of the plants that moved from Chicago located in this zone in in the same time period.

For the fifteen-year period, 1936-1950, 11.5 percent of the new establishments located in Zone B. Only a slightly smaller percentage of the new plants, 10.9 percent, located in Zone C. Zone D ranked second with 22.1 percent of the total new establishments in the S.M.A. in this period. On the other hand, in terms of the plants that had moved from Chicago, this zone ranked fourth with only 4.6 percent of the total number of these establishments. Zone E, again drew the smallest number of new establishments (0.97 percent).

The distribution of the new establishments by sectors in the S.M.A. shows that the West and South sectors attracted the greatest number of plants. The West sector drew 26.6 percent of the new industrial establishments; the South Sector attracted 35.5 percent of the plants; the Northern part of the S.M.A. drew 17.8 percent; the Northwest sector attracted 15.7 percent; and the Southeast sector drew only 4.2 percent of these plants.

Examination of the twenty-five year trend of location of new plants shows that a declining proportion of plants settled in places adjacent to Chicago. This proportion was consistently smaller than the proportion of establishments that had moved from Chicago and located in this part of the S.M.A. On the other hand, the data show an upward movement in the trend of location in the outer zones of the S.M.A., with the exception of the outermost zone, where there are relatively few towns and population is sparse. It appears that the new establishments, having no previous ties in the Standard Metropolitan Area, in contrast to the plants that moved from Chicago, tended to be more independent of the central city.

The Relationship Between Industrial Changes and Population Changes

The recent tendency for industry to locate in the cities and towns of Zones C and D (15 to 35 miles from the central city), as evidenced by the twenty-five year trend, indicates that this part of the S.M.A. may be undergoing considerable social and economic change. One factor in such change is the increase in the number of workers engaged in manufacturing. Computations were made of the estimated number of workers employed by the manufacturing establishments that located in each county of the Standard Metropolitan Area in the period 1940-1950. These data show that incoming establishments brought substantial increases in the number of manufacturing employees in these counties.[6] This was particularly true in the case of the four least industrialized and urbanized counties, Du Page, Kane, Lake (Ill.), and Will counties. The workers employed by these manufacturing plants represented a percentage increase of 92.8, 42.9, 91.5, and 81.0 respectively in each of these counties over the total number of wage earners engaged in manufacturing in 1939. If industrialization is a concomitant of urbanization, then we might expect substantial shifts in the total labor force distribution. Such however, is not the case in this particular instance if we compare labor force distributions for 1940 and 1950. Table II shows the changes in the labor force distribution between agriculture and manufacturing in the S.M.A. in the 1940-1950 decennial period. The data indicate that, although great changes occurred in terms of the number of workers employed by manufacturing plants, these changes, when taken in relation to the number of workers engaged in agriculture, were not as striking as might be expected. The greatest change in the number of workers engaged in agriculture occurred in Will County, where there was a five percent decline; but there was only a 2.6 percent increase in the number

[6] It is important to note that the greatest changes in the patterns of industrial location occurred in the 1946-1950 period and that the 1947 Census of Manufacturers does not reflect such changes.

engaged in manufacturing in this county. On the other hand, Lake County had a 7.5 percent increase in manufacturing employment and only a 2.2 percent decline in agriculture.

TABLE II—Changes in Labor Force Distribution in Agriculture and Manufacturing in the Standard Metropolitan Area 1940-1950[1]

County	1940 Percent of Labor Force Employed		1905 Percent of Labor Force Employed	
	Agriculture	Manufacturing	Agriculture	Manufacturing
Cook.........	0.5	33.9	0.4	33.9
Du Page......	6.6	23.0	3.4	30.6
Kane.........	8.2	36.0	5.8	38.8
Lake.........	5.8	25.2	3.6	32.7
Will.........	12.4	30.8	7.1	33.4
Lake (Ind.)...	2.1	57.6	1.3	53.6

[1] County Data Book, 1950 (U. S. Government Printing Office).

Nevertheless, the data indicate a general increase in the percentage of the labor force engaged in maufacturing and a general decline in agricultural employment. The impact of this trend toward greater industrialization and urbanization is felt particularly in certain communities in the S.M.A. that have experienced an unusual amount of industrial and population growth (see Table IV).

TABLE III—Population Density Changes in the Chicago Standard Metropolitan Area, 1940-1950[1]

County	Population Increase Percent 1940-1950	Density Population per Square Mile 1940	1950	Difference
Cook......	11.0	4,259.3	4,726	466.7
Du Page....	49.4	312.6	467	154.4
Kane.......	15.5	252.3	291	37.7
Lake.......	47.9	265	392	127
Will.......	17.6	135.2	159	23.8
Lake (Ind.).	25.6	570.4	716	145.6

[1] Source: County Data Book, 1950 (Washington: U. S. Govt. Printing Office).

Population changes that occurred in the S.M.A. during the decennial period 1940-1950 are shown in Table III. Du Page and Lake Counties (Ill.) recorded the greatest change in population for this period; and Cook, Kane, and Will Counties had the least population change. In terms of population density, Kane and Will Counties had the least change and Du Page and Lake Counties had the greatest change among the four least-urbanized counties. The large-scale settlement of industry in certain towns would tend to alter the occupational distribution of the population. For example, Libertyville and Mundelein were formerly residential or dormitory suburbs for the commuters to Chicago, but today they can hardly be classed as such with their present industrial complexions. The recent work of Gillin suggests that the occupational distribution of a city will affect its health, income, education, and ability to support its institutions.[7] If the assumptions of Gillin are accepted, then future studies should indicate important changes in these vital aspects of community life.

The data indicate that the coming of considerable new industry apparently had a mixed effect on the population growth of suburban and other communities in the S.M.A. (see Table IV). In some places the population more than doubled with the advent of a large number of industries; in other communities, the population increased only moderately; and in one community the population declined even though there was a substantial increase in the number of industrial establishments. The latter community, Rockdale, is a rail junction on the outskirts of the city of Joliet, and apparently many of the workers in the plants that located there commute from other places nearby. The same thing is probably true of other communities that had important increases in the number of industrial establishments.

The sectors and zones were ranked according to the numerical gains in population and industry during the last decennial period, and the ranking indicated that the phenomena were positively related, although only the North Sector in Zone D had corresponding rankings. The Spearman formula was applied to the ranking and yielded a coefficient of .718.

[7] Paul B. Gillen, The Distribution of Occupations as a City Yardstick (New York: King's Crown Press, 1951).

Place	Zone	Population 1950	Percent of Change 1940–1950
Lincolnwood	A	3,084	310.1
Skokie	A	14,281	106.7
Melrose Park	A	13,109	19.9
Franklin Park	A	8,897	195.9
Bellwood	A	8,689	66.5
Libertyville	C	5,420	37.9
Mundelein	C	3,181	139.5
Geneva	D	5,032	22.7
St. Charles	D	6,691	14.0
Joilet	D	51,601	23.8
Rockdale	D	1,399	−8.7

[1] Source: Bureau of the Census, 1950 *Census of Population*, Series PC-2, No. 40.

This study presented data on the location of industry in relation to population changes in the Chicago Standard Metropolitan Area; data were presented only for the area outside of Chicago including the suburbs and what is sometimes referred to as the rural-urban fringe. Two periods of time were examined for changes in industrial distribution, a twenty-five year period, 1926-1950 and a fifteen year period, 1936-1950; the period 1940-1950 was used to analyze the population changes that had occurred. Three hypotheses were tested by the data: hypothesis 1, that industrial establishments that locate in the S.M.A. tend to settle adjacent to the city, was confirmed by the data; hypothesis 2, that industrial establishments locating in the S.M.A. tend to take on the form of nucleated concentrations rather than long, ribbon-like developments along railroads and highways, and was also confirmed by the data. Hypothesis 3, that population growth and industrial development were positively related was also confirmed by the data.

The data indicate that important changes are occurring in the areas near our large cities and that these constitute a fruitful source for general and specific studies in social change. The practical man of the business world and the policy maker of government certainly would be interested in the results of studies concerned with the following: (1) What are the attitudinal changes of rural residents toward industrial invasion? Toward new residents from the city? (2) What are the processes of adjustment made between the new residents and the old residents of these communities in terms of attitudes, values, religious habits, recreation, etc.? (3) How does the coming of industry and new population affect the housing, school, and shopping facilities of the community?[8] These and many other questions may profitably be investigated by social scientists.

This study may be suggestive to the land economist in terms of pointing up rapid changes in land use in suburban and fringe areas and the possible resultant shifts in the balance of power in decision-making for determining land-use in these areas. Industrial deconcentration has many implications for the planner; among these implications are the working out of orderly plans for the location of industry to avoid unplanned and unsightly "industrial sprawl." Perhaps, of major importance to planners and governmental policy-makers are the implications of these data in terms of the official policy of government to decentralize our industry from the large potential target cities for purposes of civil defense in an age of atomic warfare.

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[8] See for example, "Accelerated Urban Growth in A Metropolitan Fringe Area," by The Institute for Urban Studies, University of Pennsylvania with the cooperation of The Bureau of Urban Research, Princeton University, (Philadelphia Institute for Urban Studies, University of Pennsylvania, 1954). This study is concerned with the impact of the location of the U. S. Steel Co. plant at Morrisville in the Delaware Valley area.

Urban Intent and Urban Expansion

A consideration of patterns of land subdivision and sale is a necessary, but generally ignored, introduction to investigations of the expansion of built-up areas of cities. Urban growth patterns have usually been described only from the standpoint of changes in the margin of occupied land, while theories of urban expansion relate solely to the physical spread of cities.

But physical growth (extension of the built-up area) is simply the last of a series of developments involved in urban expansion

and is preceded by two distinct phases of land preparation: initial subdivision and sale of prepared lots to individuals. These prior stages of land preparation (initial subdivision) and acceptance (individual lot sales) prepare the areal framework within which physical expansion occurs and themselves display patterns of activity and change which must be examined before the final act of physical growth can be understood.

The distributional aspects of land preparation and acceptance may be called patterns of *urban intent* since they give presumptive evidence of changing or different views on the salability or usability of land for urban purposes. Because this urban intent is an expression of man's opinion about various parcels of land and, particularly, because its patterns express areal differentiation, it is of concern to the geographer. When mapped, they present visually the stages of land preparation and acceptance occurring prior to actual building of urban structures; they are therefore of interest to planners and land economists seeking to understand past physical growth patterns or to predict probable lines of future expansion of cities.

There are several phases of land preparation and sale, and each may have particular interest for the investigator of urban growth. Therefore, the study of at least three patterns of urban intent is suggested, employing maps showing both the area and the time of the preparation or sale of land.

1. *Initial subdivision* represents the first change in the urban potentiality of rural land and is an expression of urban intent based upon the land speculator's estimate of the salability of lots. At any given date, the distributional pattern of initial subdivision represents the likely areas and directions of physical urban growth and is, in fact, the basic framework within which the city will ultimately develop.

Because land subdivision is most frequently a speculative activity, lack of detailed accordance between these patterns of initial urban intent and final city development is not surprising. However, the extent to which the actual growth of the city has corresponded, or failed to correspond, to the urban intent of initial subdividers should be of interest to those concerned with understanding the functional and structural development of the urban periphery.

2. *The sale of lots to individuals* is the final expression of urban intent preceding actual use of land for building and forms the immediate background for physical expansion. The concept of urban intent applied to individual lot sales would appear to have two uses. First, assuming a generally close correlation between patterns of lot sales and actual physical growth of the city, areally arranged lot sales data may be more easily obtained and mapped than temporally arranged building permit records and so be a convenient basis for studies of expansion of the built-up area. Second, and more important here, this final stage of land preparation would generally display significantly different temporal and areal patterns than those of initial subdivision. These differences, pinpointing past miscalculations in patterns of initial urban intent (with the premature subdivisions and perhaps "dead land" that they imply) are of great interest. Patterns of physical urban growth are not intelligible unless they are related to conditions of non-built-up areas into which the city may expand; the existence of "dead land" may well inhibit physical expansion and give rise to urban growth patterns not understandable without reference to the urban intents expressed by initial subdividers or individual lot purchasers.

3. *A resubdivision* map is one tool useful in drawing comparisons between patterns of initial subdivision and individual lot sale. It highlights many of the areas in which the urban intent of initial subdividers did not conform to the urban intent of potential lot purchasers; it marks out those districts which, although prepared for urban uses, were passed over in favor of other sections of the city. Certainly, a study of patterns of resubdivision—denoting the failure of initial urban intent to conform to the desires of ultimate users—is of interest to planners, realtors, and others concerned with the practical analysis of city growth. To the urban geographer, the patterns of resubdivision, like the other mappable features discussed here, is of interest through its expression of areal differentiation in the peripheral growth of cities. In itself, of course, the pattern of resubdivision is an expression of urban intent based upon convictions of salability of land held at later dates and predicated upon different circumstances than those motivating initial subdividers.

These suggested investigations of *urban intent* should be placed against the background of terrain, transportation, and historical conditions encountered in the local area. Only through a better understanding of the interrelationships of these factors and the various phases of urban intent can be achieved a more complete understanding of the problems of rapidly expanding subdivision activity and of physical urban growth patterns.

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Book Reviews

Bolivia: *A Land Divided*. By Harold Osborne. London, England: Royal Institute of International Affairs. 1954. Pp. ix, 144, 12s6d.

This book is presented as the first general survey of modern Bolivia to be published in England. It was completed in October 1953, 14 months after the Movimiento Nacionalista Revolucionario came into power, headed by President and fellow economist, Dr. Victor Paz Estenssoro. Since then, the transformation of Bolivia has been such that the book will perhaps become the last snapshot, in English, of a period in Bolivian history that has come to a sudden and welcome end.

It is a competent and absorbing description of the country, its history and its people, and reflects accurately the ideas and prejudices which were current and fashionable among the small group of highly polished Bolivians who entered into contact with foreigners before the revolution.

The author realizes that the country was about to experience a profound change. However, with a caution so extreme as to border on despair, he shows little confidence in the possibility that the conditions which have made Bolivia a very poor and backward country may be subject to change.

In Chapter II, "The History and the People," after a penetrating description of revolution in Bolivia "as a fairly gentlemanly and humane adjustment of power among the few *politicos* who happen to control or not to control the destinies of the country at the time" (p. 62), he adds: "This last upheaval, however, appears to mean much more than the mere swing of power from one political group to another and beyond any that have gone before bears all the earmarks of a profound social revolution." (p 66)

However, in appraising the economic policies of the new government he reverts quickly to the commonplace arguments, the pseudo-economic cliches and rationalizations, so dear to the landed gentry that ruled Bolivia in the past. With reference to the chances of success of the land reform program, he asserts: "The Indian farmer of Bolivia has neither the inclination nor the inducement to produce more than enough to satisfy his own minimum needs and, unless after a long process of civic education, a distribution of lands must be expected to result in a serious diminution of agricultural output." (p. 68) And he reinforces his dictum by referring the reader to a Bolivian authority who pontificates: "Distribution of land to the natives, which would seem the most just, unless it were preceded by an adequate agricultural education, would be prejudicial even to the Indians themselves." (p. 112)

[Contrary to this gloomy prediction are the already discernible results of Bolivia's land reform: (1) From 50 to 80 percent, approximately, of all the cultivated lands in the Altiplano and the Valley regions became the property of the Indian peasants as an immediate consequence of the enactment of the land reform Decree of August 2, 1953. (2) Bolivia had a bumper crop the year following widespread land distribution. Output of potatoes, oca, barley, quinua, corn and rice increased substantially. It would be misleading to attribute this increase in production solely to policy. Production increased largely because of good weather and timely rainfall but, nonetheless, there is one effect which was the direct result of land reform: Cultivated area increased, while many lands, particularly those which were granted to the peasants and lands which were scheduled to remain in fallow, were cultivated more intensely in response to the emergency call of the administration. Since agricultural statistics in Bolivia are unreliable, this affirmation is based on the reports of the field staff of the Ministry of Peasant Affairs, the Point IV Mission and the Agrarian Reform Service as well as the personal observations of the writer throughout the country. An indirect check is provided by the fact that notwithstanding higher food consumption in rural areas and in urban centers, the food markets did not experience scarcities of domestically produced

crops. (3) As an immediate consequence of the enactment of the land reform decree, non-paid compulsory labor and services as well as traditional debts were abolished. The flow of income which formerly went to the landlord is now received in full by the individual peasant. This redistribution of income has radically altered the composition of demand and has had the immediate effect of increasing the demand for food and for low-cost consumer goods. In a speech delivered February 16, 1954, the President observed: "The land reform even in its initial phase, has made the peasants for the first time consumers of two articles manufactured by industrial nations: bicycles and sewing machines."]

It is too early to regard the land reform of Bolivia as an unqualified success, but the progress already achieved indicates that the obstacles to surmount do not lie in the sphere of civic education nor in the establishment of landlord-serf agronomy lessons.

The transformation already achieved in Bolivia is so deep as to be irreversible. The country has been launched in a new path which may very well lead to swift economic development. Further, the fact that the United States Government has helped the present administration through direct grants-in-aid and technical assistance gives continental scope to the Bolivian experiment.

Surely, a good many books in the future will record and appraise in detail this revolution. Mr. Osborne's will be required reading for a keen, thorough and sympathetic portrait of the Bolivia that was.

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The Economic Impact on Under-Developed Societies. Essays on International Investment and Social Change. By S. Herbert Frankel. Cambridge, Mass.: Harvard University Press, 1953. Pp. viii..179. $3.25.

The eight essays in this collection by the eminent South African economist, now at Oxford as Professor of Colonial Economic Affairs, have all been published before, but few American readers will be familiar with more than the two which first appeared in this country. The collection is divided into two parts: the first five essays deal with development problems generally, the last three

with development problems specifically African. The second part seems to this reviewer to fill the larger gap in the existing literature.

Professor Frankel is the best-known spokesman for the minority of experts so impressed with the high economic and social cost of economic development as to advocate policies of go-slow, piece-meal, and small-scale changes, with constant attention to cost considerations. This clashes with what Frankel calls the "Official Concept" of rapid, large-scale, centrally-planned development, usually stressing manufacturing industry and involving sharp changes in the country's economic and social structure without much consideration of real or alternative costs. The clash is brought out most sharply in Frankel's fifth essay, which seems to summarize his Part I. This is a scathing review article on the United Nations' 1951 report on *Measures for the Economic Development of Under-Developed Countries,* which advocated massive international development loans and grants amounting to some $19 billion annually, much of it for ambitious projects patterned on the T.B.A. or the Soviet Five-Year Plan, if not on Aldous Huxley's *Brave New World.*

Frankel is also profoundly skeptical of all attempts to use national income statistics as indexes of economic welfare or of the progress of development, although he himself is a national income statistician who played the principal part in developing national income statistics for the Union of South Africa. His main original point here is that welfare is derived from activities as well as from their results. Thus, for example, the welfare of a tribe of hunters would decrease if they were forced to give up their way of life and become farmers, even though their per capita income and consumption of food would probably rise.

Frankel's position is easily understandable from experience in his area of specialization, Africa South of the Sahara; he refers often to instances which have most impressed him. From rapid economic development in the South African Union, for example, centered in its mining industries, he draws much of his distrust both of rapid economic development and of the statistical indices of economic progress. The Transvaal in particular is a statistical success story of economic development, with total and per capita income rising spectacularly over a 50-year period. But Frankel doubts whether it was worth its

cost in inter-racial friction and in the social disorganization of the native tribes, or whether it has actually reduced the amount of poverty among the native population. (His points here are put forth in striking literary form by Alan Paton's novel. *Cry, the Beloved Country*.) From a long record of African railway construction in the wrong places, and from the resounding failure of the grandiose ground-nut (peanut) schemes in Kenya, Tanganyika, and Northern Rhodesia after World War II, Frankel has acquired profound appreciation of the waste of scarce capital which can result from blundering in the large in the name of economic development. His seventh essay, "The Kongwa Experiment," deals specifically with the great ground-nut fiasco. It should be required reading for all would-be economic planners and technical assistance missionaries.

Yet for all its merits, Frankel's view will make few converts in the under-developed countries tnemselves. Professor Frankel reminds this reader of the pessimist as American folk humor defines him—the man who looks at the hole instead of the doughnut. How shall we account for the tremendous impression that the Soviet industrial advances have made throughout the under-developed world? Partly, no doubt, from ignorance of their economic and social costs, which the Soviet Government has publicized much less than it has publicized their positive achievements. But partly, also, from the impression that, in tne long run and on the whole, the results of the plans will prove well worth their costs. So that for all the invigorating effects of his showers of cold water, Frankel's generalizations from failures in Colonial Africa do not meet his opposition's case based on successes, or at least from experiences, in independent Russia, Japan, or China.

The record of America, too, is in part a record of capital wasted in obsolescent canals and unfinished railways, in part a record of soil-mining and reckless waste of oil and timber, in part a record of exploitation, pauperization, and social disorganization among some segments of the Indian population. But it does not follow in fact, although a careless reader may think it follows by Professor Frankel's reasoning, that the fur-trading days should have continued for a few decades or centuries longer than they did, or that the development of the Mississippi Valley had been better left to the French

coureurs de bois than to the Anglo-Saxon pioneers.

M. BRONFENBRENNER

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Accelerated Urban Growth in a Metropolitan Fringe Area: A Study of Urbanization, Suburbanization, the Impact of the U. S. Steel Plant in Lower Bucks County, Pennsylvania. (2 Volumes) Philadelphia: Institute for Urban Studies, University of Pennsylvania.

These books represent the same research, packaged in two convenient sizes. Volume I, *Summary Report,* is the distillate of Volume II, *Project Report,* and is a brief of the group of studies conducted by the Institute for Urban Studies, University of Pennsylvania, and tne Bureau of Urban Research, Princeton University.

The research project explored the development and early results of the rapid urbanization of Lower Bucks County, Pennsylvania, an area formerly something of a rural island in an urban sea. For some time prior to 1950 the area had been experiencing the slow erosion of urban movement outward from Trenton on the one side and Philadelphia on the other. Facilities and services were at the customary minimum for rural areas, and physical planning controls were regarded with the usual suspicion and distaste. The impetus to extremely rapid urbanization came in 1950 with the announcement and construction of U. S. Steel's huge Fairless Works on the Delaware River. Lower Bucks, long used to tolerating industry nearby, found itself under invasion. In two years time the area experienced a 39-percent population increase, a 56-percent increase in industrial employment, a 71-percent increase in assessed valuations, to note but a few of the changes. A new Levitttown was built there, as was Fairless Hills, between them accounting for over 4300 houses by the end of 1952, with thousands more scheduled for building.

In the *Summary,* the research team has catalogued the major changes, their attendant problems, the area trends and prospects, and has compiled a topically organized enumeration of significant factors of change entitled

"Guides for Urbanization." The *Project Report* provides documenting data and a more thorough exposition of most of the dynamics underlying the changes and problems highlighted in the *Summary*.

The research is a workmanlike job, well-reported. The researchers themselves recognize the major limitations of such studies when they indicate that further intensive research is needed in the study of the social processes underlying these changes. But this does not detract from the contribution of the present work, for the writers have achieved well the goal set for them at the outset of their project—to provide guides for rapid urbanization.

The reviewer feels that the study of change in Bucks County and other similar research projects have provided a basis for predictions of the changes and problems to be anticipated in rural areas which industrialize rapidly. In addition to the basic studies of social processes in decision making, which the researchers plan to pursue in the Bucks County Area, major effort needs to be expended in studying how to communicate ideas in such situations. Given agreement that certain problems require solution, how do planners and administrators communicate even the recognition of these problems to a resistant and conservative indigenous population? Such studies in the sociology of communications and social psychology are mandatory if the findings of research in rapid urbanization are to lead eventually to more efficient resource-use.

THEODORE W. WIRTHS

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Agriculture: Perspectives and Prospects as Seen by Participants in Columbia University Assembly

Business executives, economists and other educators participating in the Seventh American Assembly on "United States Agriculture: Perspectives and Prospects" (May 1955) at Columbia University agreed on the following summary of their findings at the conclusion of their discussion. There was general agreement among them on the final report but it was emphasized that it should not be assumed that every participant necessarily subscribed to every detail of the statements therein. The summary is printed here without further comment, interpretation or analysis.

Perspective

AMERICAN farm programs as they exist today have been largely conditioned by depression and war. The basic administrative machinery of our present farm programs was developed in the 1930's, hence was oriented toward problems of general economic depression and the objective of restoring low agricultural incomes to pre-depression levels. Before full recovery had occurred, war and inflation took over. The need quickly shifted from raising low farm-incomes to encouraging all-out agricultural production. Most farm prices soon rose above support levels. Soon after the war began, support prices at 90 percent of parity for many commodities were provided for two years beyond the termination of hostilities. Consumers often blamed price supports for inflated food prices. Farmers tended to overestimate the extent to which price supports were responsible for their prosperity. Actually, increased demand associated with the war economy was responsible for both.

We ended the war with our once burdensome stocks of farm commodities cleared away and a clean slate for developing a far-sighted long-term farm policy. With the recovery of world agricultural production there was a cessation of abnormally high export demand for a number of major commodities. Congress nevertheless continued to maintain price supports on many commodities at their wartime production-incentive levels. The consequence, despite the continuance of high-level domestic demand, was a return to the accumulation of surpluses in government hands and a reversion to the production-control machinery of the depression years.

Even in the absence of wars and depressions, United States agriculture would have faced serious adjustment problems as a result of its own technological progress. It has required a steadily declining number of workers to feed and clothe our nation increasingly well. A continuing large-scale movement of farm people out of agriculture into other occupations—a desirable but often difficult process—has been necessary. Furthermore, the dynamic technology of United States agriculture has steadily increased its capital requirements and the minimum scale of an efficient farming unit. It has involved farmers ever more intimately in the intricacies and instabilities of a complex market economy. Thus, agriculture has had to face major and often painful structural readjustments.

As a result of war, depression and technological change, agriculture has turned increasingly to government for help in solving its complex economic situation.

The Situation Today. Starting with already overburdened storage bins, we find ourselves today with a serious problem in working out an effective long-term farm program. In wheat, even after allowing for a desirable emergency reserve, we have enough stocks on hand to meet our domestic food requirements for a full year without further production. In cotton, we have stocks equivalent to a year's domestic mill consumption. Stocks of dairy products, rice, and even tobacco have piled up. Government commitments on price-supported commodities presently exceed seven billion dollars, with current storage costs approaching a million dollars a day.

This extremely serious surplus situation at once makes clear both the necessity for revising our farm program and the difficulties of putting such a program into effect until we have worked off our tremendous stocks. The fiscal burden of our present price support policy has resulted in drastic production cutbacks and has concentrated our attention on a comparatively small number of farm products which account for about forty percent of gross farm income. Attention has been diverted from other possible measures for the improvement of agricultural income and from the special problems of the many low-productivity, low-income farm families.

Findings

1. There was general agreement that the United States can meet its domestic food and fiber requirements at reasonable prices for the foreseeable future, providing we have intelligent land use. This group sees no important limits upon the achievement of the further technological progress in agriculture necessary to provide for our growing population and to continue to improve the quality of our diet, with profit to farmers. Technological progress depends primarily upon the flow of public and private research results as well as upon the ingenuity and initiative of the American farmer. If technological progress is to continue to be achieved we must support a wide variety of research, ranging from the most theoretical to the most practical and provide for the effective dissemination of the results.

2. It was agreed that some expansion of domestic and export markets for farm products was feasible and should be undertaken. Although an expanding market is the most desirable means of solving the problems of agriculture, such expansion is not likely to be on a scale sufficient to reduce quickly our present surpluses or to eliminate the necessity for continued production adjustments within agriculture.

Nevertheless, the group favored certain programs aimed at higher nutritional levels and more adequate diets, such as encouraging private initiative to improve food processing and marketing methods, support for consumer education programs, and strengthening the school lunch program.

3. It was generally recognized that wheat offers the most serious adjustment problem. It was felt that, because of the lack of prospects for expanding human consumption of wheat, serious consideration should be given to a program spread over a period of time to divert reasonable amounts of wheat for livestock feed, accompanied by a concerted effort to promote expanded consumption of meat and livestock products and an improved diet. Possibilities in the export market for livestock products should also be explored.

4. There was general agreement that our agricultural resources should continue to be shifted toward the protective foods such as meats, dairy and livestock products, and fruits and vegetables. More particularly,

considerable amounts of wheat acreage should be promptly returned to grass in order to reduce wheat production and serve the ends of conservation. The group generally agreed that an adequate and positive program for best land use and conservation would help cushion the shock of agricultural adjustment. Emphasis should be placed on shifting some lands now planted to surplus crops to conservation uses, such as grass and forestry, thus building a reservoir for the future.

5. The group generally agreed that too much reliance has been placed on the part which supports and production controls can play in solving Agriculture's long-range economic problems. It was noted that producers of certain major commodities—such as beef cattle, poultry, fruits and vegetables—without mandatory price supports—have made rather rapid adjustments in production and have avoided some of the difficulties encountered by producers of supported commodities. Price supports have overstimulated the production of some commodities. Production controls that are necessary for the implementation of a high price support policy tend to reduce efficiency and result in higher-cost production. There is also a tendency for the less desirable types and qualities to accumulate in storage.

In the future, price supports should play a progressively smaller role, and net income a progressively greater role in directing agricultural production. A gradual imovement toward a more flexible price support program is desirable. An orderly program of reducing present excess storage stocks to prudent reserve levels should be accompanied by positive measures to bring and keep productive resources in balance with available markets.

6. The group generally agreed that moderate price supports and storage programs are desirable means of protecting some segments of agriculture against extreme price and income instability but noted that continuing attempts to use price supports to raise farm prices are self defeating.

7. The group emphasized the opportunity and responsibility of the United States in world trade leadership. The need always exists for a rule of reason in dealing with other countries. The greatest gain for the people of the United States is in the fostering and promoting of economic development in other countries, who will in turn become better customers and suppliers as well as stronger partners in the free world. Aggressive selling and the developing of satisfied customers are essential, but forcing a larger export of farm commodities through dumping practices can cause havoc in the economies of other countries.

8. It was agreed that a stable and expanding domestic economy is of paramount importance to a prosperous agriculture to provide a strong market for farm products and employment outlets for rural people seeking non-farm jobs.

9. It was felt that there is a need for the development of more positive public policies directed toward the special problems of low-income rural families. It was agreed that, because they produce so little, such families cannot be helped significantly by price-support programs. Improvement in rural education and specialized training for farm workers are essential factors in solving the low-income problem in American agriculture. Development of industrial potential in affected areas should provide increasing opportunities for non-farm employment. It was agreed that emphasis upon adequate farm credit, with such supervision as may be necessary, is desirable as a means of facilitating enlargement of the individual farm business unit and other changes essential to the improvement of the well being of low-income families who remain in Agriculture.

10. It was recognized that the continuing migration of people out of agriculture is a necessary and desirable part of its long-term adjustment process, and it is agreed that this process should be facilitated by expanded vocational training for non-farm occupations in rural schools and by an expanded and improved employment-information and job-placement service in rural areas.

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